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For further details, communicate with

WILLIAM O. BUETTNER, Secretary
3019 Fort Hamilton Parkway Brooklyn, New York

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EDITORIAL

Education More Important

AN INCREASE in the accident rate the past year has stimulated an unprecedented volume of proposed pest control legislation in city and state. In a sense, too, this legislative influx is a reflex not only of a public not yet aware of its full responsibility in matters of pest control, but of the mixed means and varied approach to pest control on the part of the public official, the educator, the supply house and the PCO.

There is not much doubt that with a properly educated public, and the adoption of a common language of pest control by governmental, professional and commercial groups, a higher degree of pest control competency can be attained, since the knowledge therefor already exists. And with it should come not only a decline in the accident curve but a corresponding reduction in the pressure for legislation. In a word: in pest control as elsewhere, an ounce of education is worth a pound of legislation.

Of relevant and noteworthy interest is the story of the June meeting in New York of NPCA's Legislative Committee which appears in another section of this issue.

Annual NPCA Convention Likely to Be Cancelled

AS WE GO TO PRESS the Board of Directors of the National Pest Control Association is being polled on the question of whether to cancel the annual convention which was to be held in October at Cincinnati. While present indications are that the convention itself will be called off, the annual meeting of the Board of Directors will not. The latter, it is expected, will be held the same month (definite dates to be announced later) and at the same place.

P.C.O. Research

MAINSTAY OF THE PCO in effectuating his control operations has been, for the most part, academic research—government, university and manufacturer sponsored. That this has added immeasurably to respect and income for the industry cannot be denied.

But there still remains a research vacuum: the practical facets of structural pest control, which unless properly filled is likely to delimit benefits from academic research. Only the PCO, working solo or as part of a small group, is best qualified to provide this much needed liaison between academic and practical research. Already researching along these lines—and quite successfully, too—is a small but growing vanguard of forward-looking PCO's. Among these are E. R. Bellemare, Robert Hackley, Charles Pomerantz; the Clothes Moth and Carpet Beetle Committee,* comprising John Medoff, Dr. A. Brody and J. Edwin Sameth, chairman, who also heads the NPCA-BEPQ-sponsored-cooperative-research project on DDT.

Pest control, like any other profession, is a livelihood, and for many PCO's a very good one. But for the PCO who, despite financial security, has not entirely 'found' himself, or who would like to augment his professional standing, or who would like the stimulating experience of an engrossing interest, the individual research program, as Mr. Pomerantz of tick fame has found, may be just what the doctor ordered.

**Financed by the Committee Members.*

Definitions*

WE RAN ACROSS an article in the May, 1932, issue of the American Journal of Public Health by Dr. Austin M. Patterson which contains some definitions of terms of likely interest to our readers. We will not include the comments or discussions but simply the brief definitions.

germicide, n. Anything that destroys germs (microorganisms); applied especially to agents that kill disease germs.

bactericide, n. Anything that destroys bacteria.

antiseptic, n. A substance that opposes sepsis, putrefaction or decay; one that prevents or arrests the growth or action of microorganisms, either by inhibiting their activity or by destroying them; used especially of agents applied to living tissue.

disinfectant, n. An agent that frees from infection; usually a chemical agent which destroys disease germs or other harmful microorganisms (but not, ordinarily, bacterial spores); commonly used of substances applied to inanimate objects.

sterilization, n. The act or process of sterilizing, or freeing from all living microorganisms. (Sterilize—to render sterile, that is, free from all living microorganisms.)

deodorant, deodorizer, n. Anything that destroys or masks offensive odors.

insecticide, n. A substance that destroys insects, especially a preparation used for this purpose.

disinfestation, n. Definition not given but for disinfest we find this verb defined as "To rid of infestation; to free from infesting insects, rodents or other small animals." (Refer to NPCA Service Letter No. 286 for greater details.)

prophylactic, n. Anything that prevents, or that contributes to the prevention of, disease; a preventive.

**Reprinted from Crop Protection Institute Circular, May 15, 1945.*

Dr. Alvin J. Cox Retires

EFFECTIVE JULY 1, Doctor Cox, Chief, Bureau of Chemistry, Department of Agriculture, California, entered the period of automatic retirement under that State's Civil Service Act.

In the van of those who realize that what is in the best interest of the public is in the best interest of the industry too, Doctor Cox long has been an ardent advocate of better safety standards, more careful labeling requirements, etc. in agricultural and structural pest control.

Not only has he been a speaker on a number of NPCA convention programs but his informative and instructive papers have appeared on frequent occasion in our columns. For his friendly and unfailing co-operation we are, needless to say, deeply grateful.

Relieved of the burden of administration, his wisdom and experience will, we are sure, find continued expression and perhaps even greater usefulness. We wish Doctor Cox good health and long life in his retirement.

Biology and Identification of Bedbugs

By **DR. M. H. DONER,** ***The J. R. Watkins Company***

Editor's Note: The following paper was read at The 12th Annual Meeting of the NPCA in October, 1944.

IT IS THE CONCENSUS of opinion among economic entomologists that intelligent, successful insect pest control presupposes familiarity with the species involved and their respective life-histories, habitats and habits. This applies to household insects as it does to those pertaining to agriculture. It seems advisable, therefore, that we give brief consideration at this time to the biology of the Bedbug and to certain other closely related species of the Bedbug family which we are apt to encounter from time to time.

To the layman any insect even remotely resembling a bedbug is viewed with alarm. And sometimes with justification. The bites of the so-called "big bedbug" (Mexican bedbug) and of the assassin or "kissing bugs" of the South are as severe as the bites of any insect. Ticks observed on clothing after an outing are frequently incriminated as bedbugs; similarly, certain small, flat-bodied winged bugs (Aradids) that occur in wood shavings, under loose bark and other situations. There should be no reason for any Pest Control Operator to confuse these insects with the true bedbug.

On the other hand, there are several members of the bedbug family that so closely resemble the common bedbug **(Cimex lectularius)** as to be readily mistaken for this insect. Unfortunately, our knowledge of this species is very incomplete. With the exception of the tropical bedbug **(Cimex hemipterus)** which is the true bedbug of the tropics and recently reported from several localities in Florida, the several other species to which I have alluded are those that are normally parasitic upon poultry, bats and swallows but will, in the absence of their normal hosts, occasionally invade households and, depending upon the species, may attack human beings. In New Mexico and Texas the common chicken bug or Coruco is the species alleged to be more important as a household pest than **lectularius.** There are records of its occurrence in Florida. In the northern and western states houses are occasionally invaded by **(Cimex pilosellus),** a bug that is parasitic upon bats. This species is not believed to commonly attack humans and infestations do not long remain in houses after the bats have been eliminated. A report from Delaware states that these batbugs are capable of inflicting painful bites to humans.

More widespread in its distribution is the Swallow Bug **(Oeciacus vicarius).** This pale yellowish-brown bug breeds freely throughout the summer in swallows' nests but when pressed for food in early autumn when the birds migrate may cause trouble in households for a few days. I have found no published reports of actual house infestations in the states. In Canada swallow-bug infestations apparently are not uncommon. In 1940 a high school in Alberta was shut down after many students, especially girls, had complained of being bitten. It is of interest to note that this infestation occurred two weeks after the nests under the eaves had been dislodged. In another instance, the removal of swallow nests in eaves resulted in a dispersal of the insects through the houses. During the subsequent two years, although no swallows had been permitted to nest in these houses, reinfestations occurred.

There is still another species **(Cimexopsis nyctalis),** a parasite of Chimney Swifts, and occuring from the eastern states through the middle west, that some of us may run into occasionally. It is light yellow to amber in color. Extension Entomologist Nettles of Clemson College, North Carolina, records an infestation of this insect in various houses on the campus. In one instance, they were found attacking an infant. As Nettles suggests, it may well be that this is the species found in many of the houses having chimneys which are frequented by chimney swifts.

Here, then, I have given you a summary of several species of parasites, all of which may be regarded as potential enemies of man in the areas where they occur. I have been unable to find any published accounts of their respective life histories. At any rate, how can we distinguish these parasites from the common bedbug? Because variations in size and color are usually too variable it is necessary to examine certain structural details of the body. I have prepared a simplified, illustrated key to the more common species of so-called "bed-bugs". Mimeographed copies are here, available to all who are interested.

How are bedbugs distributed? The answers to this question are conflicting. The common belief that bedbugs travel between apartments or migrate from one house to another to seek food, "is not as common a habit of bedbugs as many believe" according to Back. It is the nature of the bedbug, after having sought out its host and partaken of a meal of blood, to crawl back to the same hiding place from whence it came, where it remains until hunger again causes it to seek a host. If food is not readily available, then there is the possibility that it will extend the area of its domain, although, as will be noted later, the bedbug has a remarkable ability to survive without sustenance. Infestations arise chiefly as a result of the bugs being carried to new quarters in baskets of laundry, baggage, second-hand beds, and other furniture, and by house guests that may have picked up bugs in a railway coach, movie, taxi, a hotel, et cetera. Since poultry houses are frequently heavily infested with bedbugs where they seclude themselves in wooden crates, it is easy for them to be carried into homes.

Many theories have been advanced to explain how bedbugs locate their hosts. It is not due to smell, for bedbugs react only when very close to an odoriferous substance. Odors of blood and muscle tissues have no influence on them. Perspiration odors may attract or repel, depending upon their state of decomposition. Several investigators have concluded that heat is the only stimulus which attracts the bug to its host, whether it be a mouse, rat, chicken, guinea pig, cat, rabbit, canary, pigeon or man. Nor do bedbugs show any preference in selecting their hosts. Other workers deny the attracting influence of heat and believe the host is reached either by chance or by memory. Of interest in this connection is the assertion that bedbugs and their offspring return to the same hiding places generation after generation. Who knows, but that, like ants, bedbugs utilize the ill-smelling

secretion from their stink glands, in laying down trails so that they can find their way back to the hiding places whence they originated? Bedbugs waste little time in getting from one place to another since they are known to travel at least four feet in sixty seconds. Assuming that rate of speed is related to mass, this would mean, theoretically, that a bedbug weighing .0000077 lbs. travels 56,000 times faster than a 150-lb. man moving at the rate of 150 ft. per minute.

Feeding normally occurs at night with the maximum number of bugs active in the hours just before dawn but in offices and other places inhabited only during the day, they will seek their victims in daylight. The testimony of many housewives of the ability of bedbugs to reach their victims by dropping onto beds from ceilings, is not corroborated by scientific observations.

From three to five or more minutes are required for a complete feeding and as many as nine test punctures may be made before the bug has succeeded in puncturing a capillary blood vessel. After one complete feeding, during which the bug may consume five times its own weight in blood, it retreats to protective places for six to ten days to digest its food. Of considerable importance is the fact that the bedbug can exist nearly 12 months in the complete absence of food but during this time reproduction does not occur. It is characteristic of the bedbug during starvation to swallow considerable quantities of air which serves to maintain the body in volume. Also, of practical interest is the ability of the bedbug to survive low temperatures. A two-hour exposure to a temperature of 8° below zero is fatal but they can withstand temperatures of 40° to 60° F. for extended periods of time. One hour exposure to a temperature of 111° F. kills adults, likewise a 24 hour exposure at 104° F. How long can the adults live under normal conditions of room temperature? One authority says 4 to 5 years if the insects feed occasionally but it would seem that the period of about 17 months established by the English worker Dr. Johnson is a good average.

Under experimental conditions a male is capable of fertilizing at least 3 females in 24 hours, but it is more probable that copulation occurs about once a day in nature. It is believed that several impregnations are required to insure maximum egg production during the 6 to 10 month period of life of the mature female. At normal temperature the first eggs are laid approximately 12 days after mating, at higher temperatures as early as 4 days. Under favorable conditions 3 to 4 eggs are laid daily. The world's record for egg production per female is 541 but 200 is the accepted average. How many eggs are actually laid is governed by the temperature and by the nutrition of the female. She deposits the maximum number only when she obtains regular meals, and when the temperature is at least 70° F., none are laid below 50° F. Under conditions of starvation egg-laying soon ceases. It need hardly be noted here that any crack or crevice serves as a repository for the eggs—cracks in the bed and furniture, behind loose wallpaper and baseboards, in tufts or seams of mattresses, under the edges of carpets and behind pictures and moldings. Seldom, if ever, are eggs deposited on clothing.

At room temperature of 70° F., the egg stage lasts from 6 to 7 days but at slightly lower temperatures this period may extend to 28 days. Subjection to temperatures of 40° to 50° F. for at least a month, kills them, similarly an exposure for 10 to 15 days at 28° to 30° F. One hour exposure to a temperature of 113° F. or 24 hours exposure to a temperature of 106° F. is fatal to the eggs.

The young nymph that escapes from the egg by pushing up the lid-like top of the egg, is yellowish-white in color and nearly translucent. Feeding occurs at the earliest possible moment. Perhaps it is unnecessary here to point out that the bedbug has a gradual or incomplete metamorphosis—that is, the eggs produce nymphs that are essentially similar, save in color, to the adults. The period of growth is marked by periodic sheddings of the skin, at 8 day intervals, each interval attended by at least one feeding. At 80° F. only 5 weeks are required to complete growth, but below 60° F. development practically stops. Like the adults, the young nymphs can withstand subnormal temperatures for practically 5 months without food—with food, up to 9 months.

At optimum conditions for development there may be four or more generations a year.

I have stated that, aside from food, temperature is the most important single factor in the life of the bedbug. I have described the specific effects of temperature upon the various stages of the insect. What can be said, if anything, on the effect of seasonal changes on the populations of bedbugs in houses? In England, it apparently works this way and I am describing what occurs in an unheated bedroom: At the end of winter the bug population consists mainly of adults and large nymphs with very few small nymphs. Most of the females will be unfertile. It is not likely that the bugs will feed till the temperature rises to 16° C. (60.8° F.) which in England is in the middle of May. In early summer the bugs will feed once every two weeks, once a week in August and every two weeks in September and October. Then feeding ceases because of low temperature. Considering that some of the females coming thru the winter are unfertile, it is calculated that the first eggs are laid during the latter part of May, with the peak of production in August. During the succeeding winter about 80 per cent of these small nymphs will die resulting again in a small overwintered population. "This emphasizes," according to the English workers, "the practical desirability of concentrating on the destruction of bugs at the end of winter and in early spring, where the numbers are lowest; at that time of year there are no live eggs (which are more resistant to some fumigants) than the nymphs and adults."

This is the picture that obtains in unheated rooms. In heated rooms it is pointed out that while there is a considerable winter mortality of the eggs, the nymphs and adults do survive and, as a consequence, there is a significant build-up of bug populations from year to year.

Another relationship—that of bug populations and the housing of their human host—is worthy of our attention. May I quote: "If the host is forced by poverty to live in one bed-sitting room in an ordinary dwelling house, he may be able to warm it by day (for comfort or by cooking), and the bugs will remain active throughout nearly all the year, attacking him by night. But if he can afford to live in two or more rooms, the fact that he warms the sitting room will not help the population of bugs which operates in the bedroom; if the bedroom is cold the bugs in it may increase in summer but will be numbed by the winter cold; indeed many of the bugs and all the eggs will die during the winter. In blocks of flats, however, a bedroom without a separate source of heat may be built between two living rooms or kitchens and it may then maintain a winter temperature as high as that in a bed-sitting room. We may therefore expect such blocks of flats to be especially liable to heavy infestation, because even their unheated rooms may harbour populations of bugs which breed all the year round."

This, ladies and gentlemen, concludes my brief remarks on the biology on bedbugs. The literature is exhaustive. Those of you interested in investigating the subject further would do well to consult the early publications of A. A. Girault in Psyche (Vols. 12, 13, 17), the monographic studies of the English worker, Dr. Johnson as published in the Journal Parasitology and the numerous reviews of other important papers that appear in the Bulletin of Entomological Research.

The Toxicology of Newer Pest Control Chemicals

By JAMES C. MUNCH, *306 South 69th St., Upper Darby, Pa.*

Editor's Note: The following paper was delivered by Dr. Munch at the meeting of the Eastern Pennsylvania Pest Control Association held at Hotel Lorraine, Philadelphia, Pa., May 15, 1945.

"PEST" IS DEFINED by Webster's New International Dictionary of 1938, as "1. A fatal epidemic disease; a pestilence; specif., the plague. 2. Anything resembling a pest in destructiveness, noxious, etc. plague; bane; nuisance . . . 3. Specif., any particularly injurious or destructive insect." The same authority defines "insect" as "1. In popular usage, any of numerous small invertebrate animals generally having the body more or less obviously segmented. They belong to the class Insecta, comprising six legged, usually winged forms, as beetles, bugs, bees, flies, etc. . . . 2. Any small, trivial or contemptable person." It seems wise to limit our consideration of words in order that we may know what we are talking about: It is my understanding that our organization, The National Pest Control Association includes interests in rodents and to some extent in predatory animals as well as in insecta. Furthermore, it is my understanding that certain poisonous substances are regularly employed by the operators who achieve the desirable objective of controlling infestation.

Reading the earlier reports one becomes concerned with the indiscriminate use of poisonous substances to achieve control. The rather careless methods of mixing known poisonous substances, of distributing them widely under conditions such that they may be and have been consumed by children or adults or animals lead to some degree of lack of confidence in this entire industry. However, I believe that it is a safe and justified statement that with the development of your organization, and the specific care given by your officials to the proper preparation and distribution of poisonous materials, and also the continuing attempt to improve your knowledge of the pests you seek to control and the proper methods to be used in doing so, you have merited the confidence of the general public. Such steps as have been taken to control the promiscuous distribution of poisonous products has not injured, but in fact has strengthened your organization. You now have special Seminars, and even go to school once or twice a year as post-graduates to keep posted on recent developments in this Pest Control field; efforts which are not readily matched by any other group with which I am immediately familiar.

Some two years ago I was invited by the Secretary of the National Pest Control Association, Bill Buettner, to address the National group in New York: Not profiting by the example I set there, I was invited to Pittsburgh to make another speech. Having met Martin Meyer and others of your Eastern Pennsylvania Pest Control Association at both of those meetings, and learning that I have been and still am following the pharmacological action of various poisonous substances used for the control of "pests" in the broad sense of the word, apparently led to my invitation to address you this evening along this line. You will appreciate that much of the information obtained in our laboratory studies is confidential, but I think that we can indicate the general development in this field without violating any confidences whatever. In my previous talk I discussed antidotes for the usual rodenticides: Arsenic, barium carbonate, phosphorous, strychnine and thallium, and I think that most of you have seen these antidote kits.

Since 1942 there have been a number of developments in the field of pest control and I should like to discuss some of those from the standpoint of toxicology at this time: The products, the way they exert their effects, the general information regarding acute toxicity; and antidotes for such poisons.

Since your group has always prided itself on the scientific background of the members, I should like to refer to several publications which apear to be pertinent. (1) John Q. Griffith and Edmond J. Farris edited a book "The Rat in Laboratory Investigation" published by Lippincott in 1942, which devotes almost 500 pages to various aspects of the rat, growth, diet, development, reproduction, anatomy, etc.; this is unique in assembling data from 447 references into a 35 page Table listing the therapeutic and fatal doses of drugs by various methods of administration, ranging from acacia to zinc sulfate. Reading this, one wonders when we will be able to assemble information on the toxicity of products for rats and other pests in the same manner that Hartwell made a survey of compounds which have been tested for carcinogenic activity, or Temkin and Ramsey condensed our information on antimalarial drugs. It would seem that, after the War is over and we are allowed to reveal the information which has been obtained by various Government agencies, a compilation of the toxic doses of various materials to various tests would be of tremendous importance.

(2) Frank L. Campbell and Forest R. Moulton, edited "Laboratory Procedures in Studies of the Chemical Control of Insects," and the A. A. A. S. published this in 1943. Walter C. O'Kane supervised this symposium, of some two hundred pages, dealing with various methods of growing insects of standard susceptibility, and methods of testing stomach and contact insecticides, together with a discussion of statistical methods of evaluating results.

(3) Harold H. Shepard, who was at Minnesota, and who recently was with the War Food Administration, and is now at Cornell University, Ithaca, N. Y. published "The Chemistry and Toxicology of Insecticides" through Burgess of Minneapolis. The current printing of some 400 pages reviews the world literature of insecticides, stomach and contact poisons, plant derivatives, fumigants, attractants and repellents from the standpoint of what

drugs do to insects, with some attention to toxicity to mammals.

Mrs. Marriott and I have started a long term research on the toxicology and pharmacology of substances used in pest control, including insecticides, rodenticides and probably materials for the control of vegetation, but we are just starting our investigations. I assume that your libraries will have copies of these three reference books in addition to the others which you have and use.

In looking over our information and current literature a variety of substances are found which are or could be used in pest control, and which have been developed as a result of World War II. The shortages in derris and rotenone have led to tremendous activity by interested parties and dozens of new products are being prepared. It seemed advisable to me to speak about some new antidotes for carbon tetrachloride, some work on an insect repellant, Sabidilla, cyanide antidotes, methyl bromide and DDT preparations, as typifying directions of advance of knowledge in this field.

May Meyers reported that one of the amino acids, methionine, saved the life of a man who accidentaly drank a fatal dose of carbon tetrachloride. She suggests that some chemical substance may be available in the near future to provide adequate protection to workers unavoidably exposed to substances potentially dangerous to the liver.

Sayers and Davenport, have reported studies by the Bureau of Mines, on a hazard of hydrogen fluoride poisoning, referring to the production of over 500,000 pounds annually, poisoning by humans, animals and vegetation from the indiscriminate distribution of fumes. The Meuse disaster in December 1930 is discussed in which 60 deaths developed among several thousand people who developed acute pulmonary attacks. Studies showed that the mist was probably HF. The outbreak of fluoride poisoning near Portland, Oregon, last year, led to renewed agitation for coloring of fluorides and of other poisonous substances. Fluorine causes loss of calcium; as pointed out in the consideration of antidote, definite methods can be used to overcome accidental fluoride poisoning, if started early enough. Drinking water should contain 1 milligram of sodium fluoride per liter: The optimal intake is being studied now but appears to be about 1.5 mg per day, or about 1 grain a month.

In studies on insect repellants indalone has been developed and believed to be effective. This is a combination of dimethylphthalate, ethylhexanediol and butylmesityloxideoxalate.

The investigations by Chen and associates, show a decrease in number of deaths from cyanides during the recent years, although there are still a significant number annually. Chen has reported in July 1944 the method which he developed more than 10 years ago for inhaling amyl nitrite while the physician injects sodium nitrite and sodium thiosulfate. This was successful in saving the lives of 14 of 15 patients who had received what would be a fatal dose. This has been reviewed by Bill Buettner in one of his recent Service Letters (No. 361, 4-21-45).

Methyl Bromide has been known since 1890 and feared as a narcotic and anesthetic because of its toxic effects. Haggard showed that it penetrates the tissues, hydrolizing within the cells to liberate bromine; that exposure to concentrations above 50 parts per million may be unsafe. Several accidents occurred following its use as a refrigerant. Inhalation of 5 per cent concentration in air produced death within a few minutes; exposure to 0.05 per cent caused no obvious effects in 4-hours. Pneumonia, lung irritations, degeneration of the heart muscles and congestion of the liver, kidneys, spleen, adrenals, intestines and brain, have been noted. Concentrations of 8 to 16 mg/Liter or 2,000 parts per million, proved dangerous to life after 30 to 60 minutes. By comparison the concentration of 4 mg of ammonia, 0.2 mg of arsene; 2 mg of carbon monoxide and 1 of sulfur dioxide were equally unsafe. Methyl bromide is about twice as toxic as chloroform, following repeated exposures, and about 14 times as poisonous after single exposures of 8 hours. Apparently, methyl bromide fumigation was introduced in California by the late D. B. Mackie of the State Department of Agriculture in 1935, for potato tuber moth; subsequently it has been widely used by the U. S. Department of Agriculture for disinfection of imported plant materials.

Dichlordiphenyltrichloroethane, commonly called DDT, has been developed during the last three years for various pest control purposes, against flies, mosquitoes and lice, chiefly. Detailed investigations have been made by Calvery and his associates in the Federal Food and Drug Administration, by Neal, Smith and their associates in the U. S. Public Health Service, and by Kehoe of the Kettering Laboratory, among many others. It has been shown that the application of 5 per cent DDT in talc did not produce detectable injury to humans, when used for the control of body lice. However, applications in oil or other solutions did cause injury. In animals the lethal doses ranged from 150 to 750 mg/kg after oral administration. Harm followed continued consumption of food containing 0.05 per cent of DDT, especially in rats, mice and chickens (corresponding to 500 parts per million). Inhalation of solutions of DDT may be dangerous unless great care is used. Use as a fly spray may cause skin irritation as well as systemic damage. Following exposure loss of appetite and weight, tremors and clonic convulsions have developed, although there are great variations in individual susceptability.

As a fly spray Prill reported last week that the ethyoxy derivative has definite advantages over DDT. DDT may be decomposed by exposure to iron or stainless steel, to lime or nicotine, although it seems safe to combine DDT with paris green, calcium arsenate, rotenone or pyrethrum, according to Haller and Fleck. We have been making a series of investigations on the possible toxicity of spray residues left after treatmnet of various types of vegetation with DDT and with a number of newer substances of some chemical similarity. We have observed damage to animals following the consumption of various types of vegetables that were treated during the growing period with sprays of DDT. We have found that a product known to us as "Z-39" is much safer and has not caused any detectable injury. This focuses the attention of possible users on the hazard of spray residue; that is, if a substance is used as an insecticide, may there be a harmful residue left on the food which will cause injury to the consumer of that vegetable? This was an issue with calcium arsenate or lead arsenate in coddling moth control of apples and pears; also of fluorides in the protection of growing celery and is a subject on which great investigations are always needed before widespread use of any new insecticide. It is conceivable, therefore, that additional information on the chronic effects of DDT and of similar products should be obtained before their general usage in a civilian practice. Furthermore, we have no information at this time as to possible antidotes for DDT. Consequently, its use must be considered as potentially hazardous. It is hoped that some of the investigations in this field will shed some light on this question.

I was in Buffalo last month testifying as to the safety

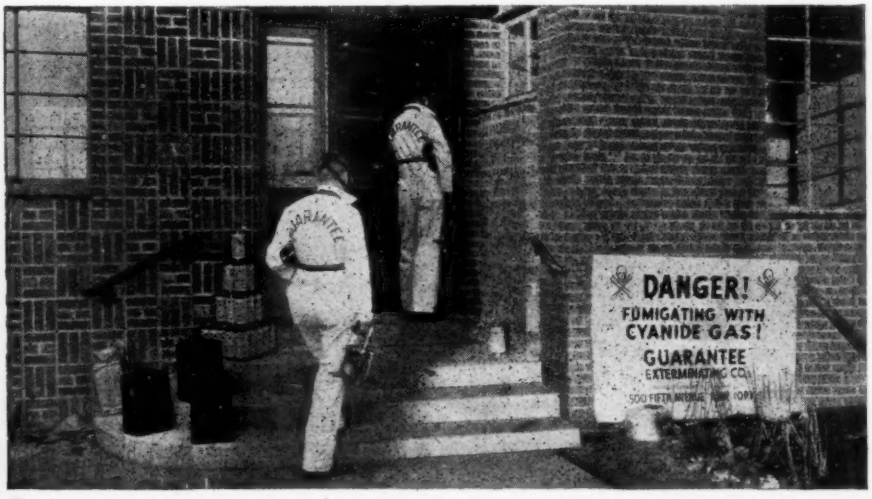
FUMIGATION NEWS

JULY 1945

Published in the interest of Pest Control Operators and the use of
AERO BRAND HCN DISCOIDS AND CYANOGAS
by Insecticide Department of
American Cyanamid & Chemical Corporation
Kansas City 6, Mo. 30 Rockefeller Plaza, New York 20, N. Y. Azusa, Calif.

Insect, Rodent and Termite Control Specialists Use HCN Discoids Exclusively for Fumigation

NEW YORK, N.Y.—One of the largest exterminating companies in this city, the Guarantee Exterminating Company, Division of Guaranteed Sanitation, Inc., has performed thousands of cyanide fumigations during the thirty-two years of business since the company was founded in 1913. Included among their clients are hospitals, hotels, steamship lines, railroad terminals, department stores, office buildings, and



The Guarantee Exterminating Company familiarly known as the "Pied Piper of America Since 1913", employs about fifty men in their operations in New York and surrounding territory.

apartment houses. Among their largest scale fumigating operations are those performed for the New York City Housing Authority, with projects running as high as 2,500 families. E. R. Jennings, vice-president and technical director of the firm, says, "*For the past ten years we have been using HCN Discoids exclusively in such work, for many reasons. We are of the confirmed opinion that any difference in cost between cyanide in this form and others is more than justified by the clean job produced by the discoids.*"

He goes on to say, "*There is also the factor of greater safety in that the discoids are sealed in air-tight metal cans before they are used, and furthermore it is possible to further increase the safety factor when using discoids by 'freezing' the gas, which is, of course, not possible when pellets are used.*"

16-ounce cans of HCN DISCOIDS now available

AERO* BRAND HCN DISCOIDS in the 16-ounce size, packed 48 to the case are now available. Of course, it is to PCO's advantage to use the 40-ounce size (and save 10¢ per lb.) wherever possible, as there are fewer cans to handle on large jobs. However, the smaller size has its place for certain kinds of fumigation work.

Cyanogas A-Dust for Rat Control

More and more Pest Control Operators are using CYANOGAS* A-DUST for rat control. If you have hesitated using it because you do not think you know enough about the way it should be used, read the following simple directions:

1. First equip yourself with a *good* Duster. The CYANOGAS Foot Pump familiar to many Pest Control Operators, comes with either a Glass Jar holding about a pound of CYANOGAS A-DUST or, (for large jobs), with a Brass Reservoir holding 5 pounds.

2. Fill the dust container. A ten-cent store soup ladle or scoop is the handiest utensil for transferring the CYANOGAS from the original container. When this is done out-of-doors, merely keep your nose away from the open can, and stand so the dust which floats up as it is dumped into the dust container does not get into your face.

3. Push the duster hose nozzle a little way down into the first rat hole, stuff the opening with a burlap bag to prevent backfire, and pump—five or six good shots of dust and then ten or so of air. The CYANOGAS Foot Pump is the only Duster equipped with a dust cut-off device to permit this operation.

4. Watch for dust clouds—they will be seen puffing up from other holes. Plug these holes with whatever is handy. Go back and give the burrow another good dose, plug the hole, and go on to the next nearest place where a hole is seen.

5. A few times and you soon learn just how much dust to apply and how much air to blow in to get the best effect. You will soon find that not only is CYANOGAS A-DUST effective and easy to use, but also very economical. You can kill more rats with CYANOGAS in an hour than you could by other methods in a week.

If you have not already used CYANOGAS for rodent control, now is the time to start.

*Reg. U. S. Pat. Off.

For more information on fumigation with AERO BRAND HCN DISCOIDS and CYANOGAS write for free manuals.

of a roach powder containing a rather commonly used agent, Lethane A-70. Our investigations have shown that product was safe for use under recommended conditions. The verdict of the Commissioner was in favor of the Exterminator who had used this product. It is hoped that equal information may be available in case litigation develops regarding any of the products used by the Pest Control operators.

With the interest which you have in knowing the identity of the pests to be controlled, the proper and safe methods of preparation and distribution of toxic materials and methods of treatment of accidental poisoning which might follow such exposure, you are making a science of this profession and building up a standing of its members. You are getting some distance from the situation described in an article in the May 1945 issue of FORTUNE: A man was walking along an English road, sprinkling a white powder on either side, a policeman who met him asked what the powder was. "It's antilion powder". The policeman told him "There are no lions in England now days". The traveler replied, "And a good thing, too, because this powder is no bloody good."

DDT WITHIN BOUNDS

By **DR. ALVIN J. COX**
Chief, Bureau of Chemistry
State of California Department of Agriculture

PART II

Effect on Beneficial Insects

THE ECOLOGY of each pest is highly important. Biological control should be expanded rather than jeopardized as there are a few striking cases where natural control has made less necessary artificial control in agriculture. It is reported that in one case when walnuts were sprayed with DDT insecticide for control of codling moth, the aphis count went up many times per leaf above normal. Control of aphis would be imperative if predators are cleaned out, and this might require several times the amount of scarce nicotine dust that normally would have been used. For several years at a time, leafhoppers possibly are kept in check by their eggs being parasitized. It might be serious if per chance parasitization were interrupted by killing off the parasites. Where codling moth in apples had been controlled by DDT the parasites that control wooly aphis were also killed, and the appearance of the malignant canker disease associated with wooly aphis was worse than codling moth. Also due to destruction of certain important predators, the build-up of the Pacific mite, the Willamette mite, and other species of mites late in the season may be several times multiplied when not in a mite region and possibly hundreds of times in susceptible areas, necessitating supplemental control treatments.

It remains to be demonstrated how it can be used without killing great numbers of useful insects. DDT is said to act as a stomach poison for honeybees, and kills bees confined in a cage dusted with a 1% preparation. If we kill beneficial insects which destroy pests that we have spent many years to develop, then we are undoing progress. There is no danger of this in household use. It is believed that when thoroughly understood and used intelligently it can be properly employed for many specific purposes without danger, but until the facts are known some hazard is involved in widespread use of DDT.

Injury to Plants and Crops

In preliminary applications, DDT does not appear to be particularly injurious to vegetation, but specific cases of injury have been reported. In using products which require an intermediary solvent, injury to plants and crops may result from this cause instead of from the primary compound. Some solvents such as the naphthalene products by their own presence are said to produce tree injury which indicates necessity for investigation of the solvents themselves. Check procedures should always be used to determine whether any observed damage is due to a material or to the solvents in which they are used.

Terminology of DDT

The term DDT is accepted as a common name and does not belong to any one manufacturer for his sole use as a brand name. The means of differentiating DDT, insecticides containing DDT, DDT agricultural dusts, and other preparations should be developed and clarified. The unmodified term DDT should not be used to describe a technical product containing a large amount of impurities.

DDT Under California Law

In the writer's capacity as Chief of the Bureau of Chemistry, State of California Department of Agriculture, one of his responsibilities is to administer the Agricultural Code with respect to insecticides and other economic poisons. This Bureau comprises the bars through which usage plans are screened before commercial application is permitted, and is responsible for keeping claims, sales and recommended uses within bounds and in line with established fact. Registration and all legal phases of pest control are most important. The sale of DDT insecticides in California will be subject to the same careful study given all such new products.

To be sold and used for economic poisons purposes in California any DDT must pass supervision and scientific tests to demonstrate satisfactory compliance with and fulfilment of all requirements necessary to provide an effective and acceptable economic poison for common usage. No economic poison in the whole pest control program has ever been completely effective under all circumstances, and few are foolproof for their specific purposes. It is unlikely that DDT is an exception.

When a product will kill pests it has complied merely with one requirement of an economic poison to serve agriculture. A greater number of effective insecticides are believed to have been abandond than have been satisfactorily marketed, because for one reason or another they were not suitable for commercial use. Before extensive use of a material known to be effective against pests, many factors must be known, for example:

(1) Hazards to the various species of plants and animals, and the difference of susceptibilities within the species;
(2) Degree of absorption by the host and translocation of absorbed quantities to other parts;
(3) Upset of biological balance, such as destruction of beneficial parasitic insects or encouragement of injurious species or interference with pollination;
(4) Production of chlorosis in plants;
(5) Undesirable blemishing of fruits such as russeting of pears;
(6) Poisoning of the soil which may interfere with growth of plants or fruit;
(7) Effects of degradation or decomposition products;
(8) Lasting effects and residual value; and
(9) Danger to human beings and other animals in use and handling.

If investigation reveals sufficient data as to effectiveness of the new material and no undue hazard to the host or to the public, or other handicap to its use, registration is issued with or without restriction, as the circumstances warrant, permitting its sale.

In addition to cautions specifically required by law, manufacturer should warn of any danger involved in the use or misuse of his product. The burden of proof at all times rests with the interested firm which must register economic poisons before they may be sold, whether for structural and household pest control or for agriculture or for other economic poison purpose. There is authority to require demonstration to establish statements claimed as fact, and to refuse registration under certain circumstances. Every effort is made to have information available in order to reduce

. . . Of interest to users of Santobane* (Monsanto's Dichloro-Diphenyl-Trichloroethane, Tech.), and to users of formulations of this famous war-developed insecticide, is this announcement of a joint research development . . . in the laboratory and in the field . . . by Monsanto Chemical Company and McLaughlin-Gormley-King Co. whereby the latter will be able to offer to its many licensees dependable formulations of Santobane for pest control.

This first announcement of such a combined operation does not mean that consumers can immediately expect Santobane formulations to end insecticide problems in industry, on the farm or in the home. Santobane is still going practically 100% to the military, with only experimental quantities available for other use. Also, there is considerably more to be learned about Santobane's proper formulation as well as its toxicity to humans before its full effectiveness or its limitations can be determined.

But the program as announced here has been set up, excellent results have been achieved, and the millions interested in positive pest control can look forward with confidence to the same excellent results from Santobane's peacetime applications as are being achieved in war. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second St., St. Louis 4, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

Reg. U. S. Pat. Off.

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

to a minimum time-absorbing demonstrations by an applicant for a certificate of registration.

Labeling DDT

It now seems essential that the label of each DDT product carry the word "POISON" and the vignette representing the skull and cross-bones on main panel of the label and also appropriate cautions with regard to proper handling. A special warning notice is necessary if the DDT is in solution. The DDT content in the product should be guaranteed as to its percentage of dichlorodiphenyl-trichloroethane. In addition, the label must generally have directions for use, showing the pests and crops to be treated, together with precautions against any misuse of the material. The danger of poison residue on crops should be stressed on the label and the user should be warned not to employ DDT materials on crops where the residue would create any public health hazard.

When a product is intended only for inclusion in preparation of a finished economic poison spray or dust, such as dissolving in oil or other organic solvent or mixing with pyrophyllite or other dry extender, adequate directions for use may still be necessary.

In powdered form DDT resembles sugar or flour and the greatest of care must be taken to label each container distinctly. Confusion of every kind must be avoided.

Some economic poison products are of very definite value for the purpose intended when the user complies with all the circumscribing factors, and of comparatively little value under other conditions. Therefore, the claims made for such products are carefully scrutinized in order that the necessary conditions of use be not minimized and that the prospective user be directed to apply the material under suitable weather or other conditions.

Present Status of DDT

At the meeting on November 20, 1944, of the California USDA War Board Economic Poisons Advisory Committee, of which the writer is chairman, it was the unanimous opinion that requests for DDT for pest control purposes should be allotted through economic poisons registrants who have adequate facilities to carry on the difficult grinding and other procedures to prepare dusts and sprays, and who agree to use adequate safeguards. The Committee readily endorses the quantities needed to continue reputable experimental and pilot development work, and desires to encourage conservatism until experimental work has been completed. In view of the exceedingly limited supply of pyrethrum, the scarcity of rotenone, and the inadequacy of available nicotine, it was agreed that effort should be extended to secure for California agriculture all the DDT that could be used without hazard in view of present knowledge. The Committee was of the opinion:

(1) That at present, or until the Food and Drug Administration sets a tolerance or otherwise satisfactorily passes judgment on acceptability, DDT should not be used on any product that is to be directly consumed.

(2) That in the absence of further information and in order to protect California soil, DDT should not be directly applied to the soil nor used on any crop where there is more than a minimum run-off onto the ground. DDT in soil in substantial quantities may interfere with growth of plants. Small dosages such as might be used for control of grape leafhopper on grapes, would seem not hazardous in this respect.

(3) That DDT should not be used where it is likely to be absorbed in plant tissue until authoritative information is available.

(4) For those instances where it is accepted that there is not too great a hazard, there should be a backlog allotment of DDT for use in California in case other pest control materials are not available for specific purposes, such as control of leafhopper and of sharpshooter and of leaf-skeletonizer on grapes in one application prior to bloom, citrus thrips, codling moth on walnuts, canker worm on prunes, pea aphis on peas before formation of pods, and worms on vegetables grown for seed. A suggested backlog amount to be allocated for use as needed was estimated to be approximately 400,000 pounds of DDT in 1945.

Pest Control Operators in California have been asked to estimate their probable annual requirements for DDT as an alternate or supplementary material in their operations. This information is necessary in order that the Office of Civilian Requirements may have dependable data on which to base recommendations for allocations.

The nation's leaders in manufacturing, research, and use are agreed upon the advisability of avoiding too rapid commercial exploitation of this insecticide. The interests of agriculture and business will be served better by a conservative utilization of DDT for economic poisons. A special committee appointed at the outset of the recent Annual Meeting of the American Association of Economic Entomologists in New York City to prepare a summary on DDT realized that it must undergo many tests before it can be used generally for control of agricultural pests, and the committee's statement was adopted.

The report stated in part that within limitations never in the history of entomology has a chemical been discovered that offers such promise to mankind for relief from insect problems as DDT. The committee stated in part: "DDT will not kill all the important insect pests. It will kill many beneficial insects which are allies of mankind against the destructive species. Because of its toxicity to a wide variety of insects, its large-scale use might create problems which do not now exist . . . The research reports emphasize that we have not had time to develop entirely satisfactory mixtures and dosages of DDT insecticides, nor the methods and timing of application for many possible uses . . . More and larger-scale experimentation is needed . . . "

The cost of primary DDT of technical grade is now 60 cents per pound from two of the leading manufacturers, and it may be reasonable to expect some reduction when it is in full production for civilian use. Incorporation of DDT into dusts offers more difficulties than are encountered with ordinary preparations and if this is not properly done it will not serve its purpose. One should not dissolve too much DDT or try to make it do all the work, for perhaps petroleum spray oil may be made to accomplish the major part of the control of certain insects and be only assisted by a small amount of DDT. The application of DDT in oil vapor by means of the fog spray method seems promising.

The DDT aerosol used by the armed forces against mosquitoes also has possibilities in agriculture if the DDT can be made to settle faster, afford greater concentration, and deposit a mist on foliage. Freons are the best solvents except methyl chloride which is too toxic for households but useful for control in such places as outdoor recreational areas. Addition of a few per cent of a solvent boiling between 20° C. and 60° C., such as acetone, influences the particle size and produces the so-called "Heavy aerosols" for agricultural use. A small amount of ordinary petroleum spray oil may serve the purpose.

Dr. Froelicher of the Geigy Company, uttered a word of caution with regard to DDT and stated: "This is a new product and as such requires years of research under normal conditions. True, with the terrific energy expended by scientists throughout the country, much has been learned in the past two years. However, let us not forget that much more work is needed and much more work will be done before all ramifications are known."

Misinformation About DDT

Undue enthusiasm for new products is a perennial problem. For example, some clippings from advertisements are as follows:

An absolute departure from other presently used spray materials such as arsenical, nicotine, and fluorine preparations.

Avoid risks! Change from poisons.

High speed killer.

Residual killing effect.

All around spray protection.

Solves the residue problem.

Revolutionary in performance! Unequalled for control, speed and economy.

A substitute for lead arsenate.

Many have probably heard these or similar broad claims made for DDT, but these particular quotations are not about DDT insecticidal compositions; they were made ten years ago with regard to phenothiazine, xanthone, and rotenone when these products were first being used and before their specific uses were fully understood. Some of these statements may be somewhat true in specific instances, but they left a misleading impression. The illustrations are given to direct attention to the striking parallelism between claims then and now. Probably the economics of a situation make it inevitable that at first there exists misinformation about almost every new economic poison.

Eventually rotenone made good, not as an alternate material for lead arsenate or an alternate for anything else. It is very specific against **certain** insects, which is one reason for its being so highly successful. It cannot be said that rotenone completely replaced any one of the other insecticides. In California a product must be sold on merit and not in comparison with any other product. With regard to DDT for agricultural pest control one may have the same situation over again. Furthermore there is little doubt that DDT has served as a starter and there are rumors of greater development in the field of synthetic organic economic poisons.

In the absence of adequate information, from time to time many fiction writers in daily newspapers and in the popular press

have erroneously said that DDT is entirely harmless to human beings and domestic animals and pets. No product with these qualities is known to exist, nor is such a pharmacological distinction between insects and other animals likely to occur. Any substance that will injure insect protoplasm undoubtedly will injure protoplasm of warm-blooded animals, whether eaten or absorbed by contact.

Many institutional and manufacturers' research and development chemical and entomological scientific laboratories are being established and these may lead to discovery of many other new and equally useful economic poisons chemicals. Let us thoroughly test all possible insecti·ides. The extensive studies currently being carried on with DDT should provide data for intelligent handling in agriculture. Extravagant claims are frequently the temptation of new manufacturers who are not sufficiently informed about economic poisons. On account of its peculiarities, DDT needs more than usual attention.

Much has been written about the ability of DDT to kill insects, but that is not the whole story. Among extravagant claims are statements that if you dust your cat with DDT you can say good-bye to fleas; if one insect invader alights on a leaf of your garden that has been treated with DDT the pest topples over dead. "The layman's dream that one application of DDT will solve his problem is a myth."

Many new insecticides have been placed on the market without undue push or restraint and have found a place, but **no** new product should be put into general use without an established background, without a full investigation of its effectiveness for each particular pest against which it is to be recommended, and without a knowledge of the proper precautions to be observed. DDT already has been proved to have specific uses, but further uses should be substantiated before they are advertised.

Fumigators Launch Co-Operative Advertising Campaign

A co-operative advertising campaign, themed to sell a year 'round pest control program to the nation's 52,000 food processing plants, has been released in trade publications effective with the May issue.

First of its kind, the campaign, in which seven of the pest control industry's outstanding fumigation firms are co-operating, marks a milestone in industry public relations. The program consists of two-color double-page spreads for the month of May. Remainder of the program, which will run through September, consists of two-color single-page ads. The following national publications are being used: American Miller, Food Industries, Milling Production, National Butter & Cheese Journal, Southwestern Miller and Seed World.

The copy, addressed to food-processing companies, is crisply worded and persuasively reasoned, stressing that the year 'round pest control program affords a constant pest control—with fewer fumigations—at a lower overall cost. It also explains that each job is handled by the pest control operator nearest to the plant. Dealings, however, are only with the fumigator located in the main-office district.

To complement the trade paper campaign, direct mail pieces are being sent to the executives of 19,000 of the 52,000 food processing firms which, it is understood, control 90 per cent of the food processing industry's sales volume.

Firms participating in this program are: Cook & McLeod Industrial Fumigators, Minneapolis, Minnesota; Cook Chemical Company, Kansas City, Missouri; H. T. McGill, Houston, Texas; McLeod Industrial Fumigators, Inc., Buffalo, New York; Orkin Exterminating Company, Inc., Atlanta, Georgia (and all its branch offices); Vogel-Ritt, Inc., Philadelphia, Pa. (and several of its branch offices); and National Industrial Fumigant Co., Cleveland, Ohio.

Originator of the campaign idea, and supervising it from the blue-print stage to the printed page, is Harry E. Studier of the National Industrial Fumigant Company. The MacManus, John & Adams Company of Detroit, Michigan, nationally known advertising firm, is serving as the advertising agency.

While a program of this nature is admittedly costly, running into several thousand dollars, it is hoped that other firms will take steps to place our essentially necessary industry on the same high plane of endeavor through co-operative advertising and selling plans.

when
PENN-DRAKE INSECTI-SOL
IS USED AS A BASE!

The longer your insecticide floats through the air, the longer the *killing power* is effective.

Choose INSECTI-SOL for YOUR insecticide to provide the longer killing power and for a perfect base that is crystal clear, odor-free—and WILL NOT STAIN CLOTHING, DRAPES, RUGS, etc., because it evaporates *entirely* when its job is done!

Write Dept. 108 for "case histories" in which INSECTI-SOL has played an important role in building more successful insecticide business.

Mothicides, too—Penn-Drake Odor-Free Naphtha is an ideal base for Mothicide preparations.

Penn drake petroleum products

PENNSYLVANIA REFINING COMPANY
General Offices: BUTLER, PA.
Refineries at KARNS CITY and TITUSVILLE, PA.
Makers of White Oils (U. S. P. and Technical); Petrolatums (all grades and colors); INSECTI-SOL (deodorized insecticide base); Odor-Free and other Naphthas; Petroleum Sulphonates; Waxes; Industrial and Motor Lubricants and Greases; Fuel Oils and other petroleum products.

Charles Pomerantz Addresses Doctors at N. Y. Skin and Cancer Hospital

Editor's Notes:

CHARLES POMERANTZ is one of the principals of the Bell Exterminating Company of New York City. Ticks have become a hobby with Charlie. His presentation of this subject reflects the painstaking manner in which he has carefully studied everything available about ticks and results of practical experience in the field of extermination and control.

The medical profession viewing the importance of ticks, more particularly because of the increase of Rocky Mountain Spotted Fever and other tick-borne diseases such as Tick Paralysis, Tularaemia, Colorado Tick Fever and Relapsing Fever welcomed the address given by Charles Pomerantz at the New York Skin and Cancer Hospital, New York City on June 1st. Forty physicians were in attendance.

After describing the medical, economic and phychological importance of ticks in the United States with special reference to the eastern states, Mr. Pomerantz reviewed the life cycle, habits, host relationship and distribution. Emphasis was placed on the Rocky Mountain Spotted Fever Tick (Dermacentor andersoni), American Dog Tick (Dermacentor variabilis) and the Brown Doc Tick (Rhipicephalus sanguineus).

A careful outline was followed which allowed for discussion of disease to animals, immunity to tick bites, mechanism of a tick bite, outstanding facts about ticks and diseases they transmit and controls. In general, the PCO is interested in the extermination of ticks that infest structures but it was pointed out by Mr. Pomerantz that our industry must look to the medical profession and veterinarians to assume their rightful functions if the PCO is to make headway in control.

The outline was presented to those in attendance with the following forward:

A mild but ever growing epidemic of dog ticks during the past few years, the attention paid to ticks by nationally known magazines and the general press, the fear, worry, and emotional attitudes to which the population is subject make a discussion of this problem timely and of absorbing interest to the physician, veterinary, pest control operator, layman and all those who are either directly or indirectly affected by this tick menace.

Two of the pages that formed a part of the outline are worthy of reprinting here.

Arthropod (jointed foot)
Sub-animal kingdom

Arachnida		Insecta
Ticks		
1. Adults, 8 legs.		1. Adults, 6 legs.
2. Head and thorax fused.		2. Separate head, thorax and abdomen.
3. Have tracheal tubes and pair of spiracles for respiration.		3. Female larger than male.
4. Wingless.		4. Definite sex.
5. No antennae.		5. Breathe through tracheal tubes and many spiracles on both sides of thorax and abdomen.
		6. Single pair of antennae.
Spiders	Acarina	
	a. mites)	
	b. ticks)—blood sucking.	

*THE MOST IMPORTANT TICK-BORNE DISEASES

Organism and Disease	Ticks Associated with its Transmission	Reservoir	Methods of Transmission	Distribution
Dermacentroxenus rickettsi (R.M.S.F.)	Dermacentor andersoni D.Variabilis	Native rodents Hereditary in ticks	By bite of tick	Western U.S.A. Eastern U.S.A.
Bacteria tularense (Tularaemia)	D.andersoni Haemaphysalis Leporispalustris	Native rodents Rabbits	By bite of tick Contact infected tissues or excrement	U.S.A., Russia, Japan
Tick Paralysis	D.andersoni D.venustus D.variabilis	?	By bite of tick	N. America, Europe, Africa, Australia
Spirochaeta recurrentis (Relapsing Fever)	O.moubata O.talaje O.turicata O.erraticus O.hermsi O.parkeri	Hereditary in ticks	Bite, coxal fluid, feces	Africa, Europe and U.S.A.

POTENTIAL CARRIERS OF TICK-BORNE DISEASES

Tularaemia	Rhipicephalus sanguineus D.variabilis		
Dermacentroxenus rickettsi (R.M.S.F.)	Rhipicephalus sanguineus		Proven experimentally By bite of tick

*After Herms

U. S. Careful With DDT: May Kill Too Widely

By Associated Press

WASHINGTON, May 14.—The government is going to use the bug-blitzing DDT cautiously in large scale outdoor attack on insects until it is sure the checks and balances of nature won't be upset.

Major General Norman T. Kirk, Army surgeon general, said extensive investigations are now being carried out to determine the usefulness and possible hazards in using DDT as part of a plan to guard against the spread of malaria by troops returning from overseas.

DDT (dichloro-diphenyl-trichlorethane) is highly effective in ridding areas of mosquitos and other disease carriers. In general, it is used in two ways—as an outdoor spray, distributed by planes when used over large areas, and as a residual spray application for houses and other buildings.

Kirk said the Army's anti-mosquito program has been intensified in military areas and the United States Public Health Service has extended its activities to include certain additional selected areas in the South where risk of transmission of malaria is greatest. But he added:

"Plans to employ DDT indiscriminately for outdoor control of insect disease carriers in this country will not be encouraged until the various agencies studying the subject have done more research work on the general biological effects of this insecticide."

A joint statement by the Army and the Health Service added that "distribution of DDT from aircraft for large-scale area control of mosquitoes in military and adjacent areas in the United States will be limited to projects conducted with due regard to the possible effects of DDT on beneficial insects and all forms of plant and animal life."

Reprinted from Memphis Press-Scimiter, May 14, 1945.

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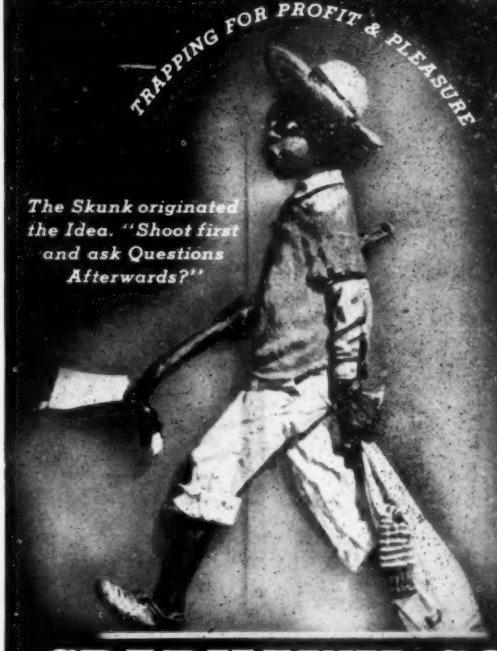

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Bulletin No. 1911 of U. S. Dept. of Agriculture, Bureau of Entomology, states: "Pentachlorphenol when applied as a 5% solution of fuel-oil type carrier penetrates the ground readily and is toxic to termites." *Write for details.*

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Pyrethrum and Rotenone Supply Situation

By **R. B. STODDARD**, *Dodge & Olcott Co.*

THE REVISED METHOD of allocating pyrethrum and rotenone described below makes no immediate change in their availability for uses other than those already permitted.

Rotenone is still restricted to essential agricultural uses except where specific exceptions are permitted as in the case of limited amounts which have been allocated for tick control and similar special instances which may arise in the future.

In the case of pyrethrum, limited amounts are being allocated for use in food processing plants, and so forth, and even more limited amounts of powder to Pest Control Operators. No important change can be expected in time to affect third quarter allocations.

However, the supply situation is improving steadily, and if this continues, as we believe it will, there is some prospect that pyrethrum will be much more freely available for the fourth quarter than has been the case for several years. This improvement probably will not be great enough to permit removal of restrictions on either end uses or quantities allocated, but we anticipate the probability that these restrictions can be considerably liberalized.

Revised Methods of Allocating Pyrethrum and Rotenone Effective July 1st

As of July 1st allocation of rotenone and pyrethrum materials by WPB will be under Appendix "B" of Order M-300 instead of Appendix "A" as heretofore.

Please bear in mind that this change does not in itself imply greater supplies, particularly as regards rotenone; nor does it alter the permitted end uses. It does alter the mechanism of allocation in the following ways:

(1) Allocations will be made on a QUARTERLY BASIS. Orders for your requirements for the third quarter (July, August and September) should be in the hands of your supplier by June 10th **at the latest.**

(2) It is no longer necessary to use WPB-2945 form or to file requests in Washington. All that is required is that you place your order for the desired quantity with your supplier and **include on the order** a certified statement of end use. If the material is required for several end uses they should be listed separately, and the amounts intended for each end use specified. **For example,** if you are requesting rotenone partly for ox warble control, partly for small package insecticides, and partly for commercial sizes, the amount you propose **for each use** should be specified, and any other information included which will be of assistance to the allocator.

(3) You have complete freedom of action as regards your choice of supplier. If you choose to split your requirements between two or more suppliers your total allocation will remain the same but will be divided among those suppliers in the same ratio in which you have divided it. Allocations of raw material to suppliers will be made adequate to cover any allocations made against them.

(4) Suppliers must file a 2947 form on June 10th for the third quarter allocations. On this they must list all properly certified orders which they have received, including end-use information. Within a week after return of this form from WPB they must advise customers of the action taken and the amount allocated.

(5) WPB allocations, as in the past, will be based on quotas, modified to some degree by regional and end-use factors, and the total amount allocated per quarter will, of course, be based on available supplies. Obviously no one can hope to receive an undue proportion of their yearly requirements during a single quarter, and nothing is to be gained by requesting disproportionately high amounts.

(6) **Interim requisitions should be kept at a minimum.** From the WPB point of view this saves paper work. From your point of view it avoids delay and disappointment in the event that the regular quarterly allocations have exhausted the available supply. **We strongly recommend** that you cover your full quarterly requirements by the initial order to be placed BY JUNE 10TH.

(7) Deliveries will have to be spread over the quarter as supplies become available. **We suggest** that in placing your order you indicate what portion is required for each month.

John Powell Co. Reports Pyrethrum Supply Situation Fast Improving

In a letter to the trade on June first, John Powell & Co., Inc. states "the pyrethrum supply picture is fast improving, and there is reason to believe that substantial quantities will be available within the next six months."

Continuing, the letter reports: "Production of pyrethrum flowers in Kenya, Belgian Congo, and Brazil has been increasing steadily and has reached the point where the supply exceeds military requirements. As a result, larger quantities of pyrethrum are now being allocated by the War Production Board for use in dairies, creameries, for the protection of stored foodstuffs, for exterminating, and for specified agricultural uses." . . .

Rats Pay $1 Interest On Loan

This is the old, sad story of how money brought about the downfall—of a mother of eight.

And how one man smelled a rat—and how he was only too right.

The story starts several nights ago when George DeMent, manager of the Star Package Store, 1209 Westheimer, put $88 in bills in an envelope, hid it in the store basement.

The next morning the money was gone. No one had gained entrance, nothing else had been taken.

So the next night, Mr. DeMent put some coins in an envelope, left it in the same place. The same story—it was gone.

It was then that Mr. DeMent smelled a rat. That night, he put some old papers in another envelope, tied a string to it, hoped the string would lead to his lost money.

But he didn't know his visitor, the rat. The next morning the envelope was gone, all right—but the string had been broken, so it gave no clue as to the route used.

Mr. DeMent was sure his money was gone. But he could get revenge, at least, and prevent future depredations.

So he called on Long's Exterminating Co., 2003 Welch. H. T. Long and an employe, Fell Mays, traveled to the liquor store.

Young Mays, who is slender, crawled under the store.

"There's all kinds of rat holes under here," he called back.

Mr. DeMent was surer than ever his money was gone. It looked like more would go after it when he paid the exterminator's bill.

"I'll tell you what I will do," he offered. "I'll split the money with you if you find it. And sell you a bottle of good liquor, to boot. You get nothing if you don't find it, except a drink."

Mr. Long and Mr. Mays agreed.

Mr. Mays started digging. And at the end of an eight-foot tunnel, uncovered a rat's nest, with eight baby rats in it. And all of the money, although $23 was somewhat torn.

And to cap the climax, an extra dollar bill, apparently interest.

The exterminators put $44 in their pockets, a drink somewhere else and departed.

All were happy—except the rats.

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200 lb. bbl. .....30c per lb.

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25% Pyrane — 50% Sodium Fluoride — 25% Talc

100 lb. drum .....25c per lb.

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Roach, Ant and Bedbug Powder

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1. Killing power equal to ground pyrethrum flowers.
2. Speed of action equal to pyrethrum flowers, and considerably faster than sodium fluoride.
3. Safety to warm-blooded animals.
4. Good tenacity—Sticks to insects and dusted surfaces.
5. Ease of handling in bulb type dusters or mechanical equipment.
6. Large Bulk—A given weight of powder goes farther.
7. Economical.

Priced as follows:

1—100 Lb. Bbl. .....38c per pound
3—100 Lb. Bbls. .....35c per pound
5—100 Lb. Bbls. .....33c per pound
10—100 Lb. Bbls. .....31c per pound

Terms: All prices F.O.B. Indianapolis, Indiana

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Additional Patents Relating to Pest Control

By DR. R. C. ROARK.

2,370,881 (Mar. 6, 1945; appl. April 2, 1941). METHOD OF PEST CONTROL. Theodore G. Roehner, Malverne, N. Y.—Socony-Vacuum Oil Company, Incorporated, New York, N. Y.—A method of controlling insects having a water-dwelling life phase comprises applying to the water bodies wherein they may develop a hydrocarbon oil of highly cyclic nature having a specific gravity of at least 1.0 based on water.

2,371,112 (Mar. 6, 1945; appl. June 29, 1943). DITHIOBIURET AND METHOD OF PREPARATION. Russell L. Sperry, Stamford, Conn.—American Cyanamid Companyl, New York, N. Y.—A method of preparing dithiobiuret comprises heating dicyandiamide with hydrogen sulfide under pressure in the presence of an inert solvent. It may be used as an insecticide, and may be applied for such purpose in solution or suspension in water or in other liquid medium.

2,371,113 (Mar. 6, 1945; appl. Feb. 29, 1944). METHOD OF PREPARING MONOTHIOBIURET. Russell L. Sperry, Stamford, Conn.—American Cyanamid Company, New York, N. Y.—A method of preparing monothiobiuret comprises heating together a member of the group consisting of guanyl urea and guanyl urea carbonate, and hydrogen sulfide under pressure in the presence of an inert solvent. It may be used as an insecticide.

2,371,152 (Mar. 13, 1945; appl. Sept. 30, 1943). DEVICE FOR EXTERMINATING RATS, ETC. Porter J. Coates, Cleveland, Ohio.—Powdered poison is distributed throughout a building by means of compressed air through a system of pipes.

2,371,447 (Mar. 13, 1945; appl. Nov. 30, 1943. LATCH FOR RODENT TRAPS. David F. Jorgensen, Temple City, Calif.

2,371,546 (Mar. 13, 1945; appl. Mar. 13, 1942). SPRAY GUN. Harold A. Roselund, Toledo, Ohio.—The De Vilbiss Company, Toledo, Ohio.

2,372,183 (Mar. 27, 1945; appl. May 16, 1944). PURIFICATION OF PYRETHRUM EXTRACT. William F. Barthel, College Park, Md., and Herbert L. J. Haller, Washington, D. C.—United States of America, Secretary of Agriculture.—A process of separating pyrethrins from a solution of relatively impure pyrethrum extract in a petroleum hydrocarbon solvent, comprises mixing the solution with an aliphatic nitro compound having the formula RNO_2, where R represents an alkyl group, separating the aliphatic nitro compound solution from the petroleum hydrocarbon solution, and contracting the aliphatic nitro compound solution with activated carbon.

2,372,439 (Mar. 27, 1945; appl. Oct. 6, 1942). GARMENT BAG. Gustaf Einar Lofgren, Riverside, Conn.—Electrolux Corporation, New York, N. Y.—An object of this invention is to provide an airtight bag that can be charged with a demothing ingredient and will retain same for a considerable period of time.

2,372,678 (Apr. 3, 1945; appl. March 31, 1941). LIQUID SPRAYER. Lester C. McKay, Elmwood Park, Ill.—Sears, Roebuck and Co., Chicago, Ill.

2,372,747 (Apr. 3, 1945; appl. October 18, 1943). COCKROACH CAPTURING DEVICE. Frances J. Sullivan, Los Angeles, Calif.

2,372,809 (Apr. 3, 1945; appl. March 14, 1944). THIOCYANO ETHER ALCOHOLS. Herman A. Bruson, Philadelphia, Pa.—Rohm & Haas Company, Philadelphia, Pa.—These new thiocyano ether alcohols are water-soluble liquids having useful properties as insecticides or larvicides. An example is Beta-thiocyano-isopropoxy-isopropanol.

2,373,068 (Apr. 3, 1945; appl. December 8, 1943). RODENT TRAP. James Turpan, Paterson, N. J.

2,373,428 (Apr. 10, 1945; appl. July 21, 1941). INSECT KILLER. Obed W. Stone, Webster Groves, Mo.—This machine kills insects in a moving stream of grain by electrical means.

2,374,387 (Apr. 24, 1945; appl. February 6, 1943). TOXICANT PETROLEUM PRODUCTS. Vladimir L. Shipp, New York, and Arthur C. Pabst and Robert B. Killingsworth, Douglaston, N. Y.—Socony-Vacuum Oil Company, Inc., New York, N. Y.—An insecticide composition contains as a characterizing ingredient, a material derived from a petroleum fraction by a multiple pass cracking in the presence of adsorptive contact mass material having an initial boiling point of the order of 500° F. and a mid-boiling point of at least about 550° F. and not over about 750° F. and having a killing power when present in a concentration of 5% in a non-toxic insecticide base oil as measured by the official Peet Grady test of at least 16% greater than the official test insecticide under comparable conditions.

2,374,479 (Apr. 24, 1945; appl. September 4, 1942). INSECTICIDE. Samuel I. Gertler and Herbert L. J. Haller, Washington, D. C.—Secretary of Agriculture, U. S. A.—The semicarbazones of cyclopentanone, cyclohexanone and methylcyclohexanone act as stomach poisons to codling moth larvae, Hawaiian and southern beet webworms, melon worm and southern army worm.

2,374,522 (Apr. 24, 1945; appl. December 15, 1943). TRAP. Edward F. Andrews, Youngstown, Ohio.

How to Make a Structural Pest Inspection

By J. M. MILLER

How to Make a Structural Pest Inspection, and the information to be assembled for estimating the control work to be done is outlined by J. M. Miller of J. M. Miller Pest Control System, Hollywood, California.

The following suggestions are very helpful to any PCO's in their service work.

1. Sketch a foundation diagram of structure approximately to scale.
   a. Indicate on drawing the location of all projections such as: porches, patios, wall projections, archways, pergolas, meter boxes, downspouts, etc.
   b. Name each item mentioned in (a) above, or any other parts of the structure connected with the house.
   c. Examine each item mentioned in (a) to see if wooden parts contact the ground or dirt fills. Examine for termite infestations, fungi infections, and structural defects.
   d. Inspect around all outside windowsills, wooden projects, and ground under wooden siding, for drywood termite pellets. Mark infestation on diagram.
   e. Inspect the exterior of the building near foundation to determine the height of foundation above or below the grade line. Indicate the location of "below the grade" on drawing.
   f. Determine the porch construction. Note cracks, replacements, settlements, dirt-fill contacts of wooden underpinning, etc.
   g. Mark in existing airvents: size, state if in direct contact with ground and what materials they are covered with. Indicate on diagram where new air vents are necessary.
2. Inspection of the interior of the building: sagging and discolored hardwood floors; warping; paneling; dragging doors. Inspection of bathroom: shower walls and partitions for discoloration and for leaking cracks.
3. Inspection of improved basement areas for termite infestation of all types, and fungi infections; also including inspection and determination of the type of column construction, interior partitions, basement stairs, etc.
4. Inspection of attic areas for Drywood termites and for other insect infestation; including inspection of roof areas for roof leaks, air vents, inaccessible areas, and necessary roof bracing.
5. Inspection of the under area for all kinds of termite and beetle infestation, and for fungi infections.
   a. Inspection of porches, patios and other dirt filled areas having concrete floor slabs, for termite infestations of all types, and for fungi infections, as well as construction defects. Make note of information acquired on diagram.
   b. Note if sheathing goes down below foundation.
   c. Check on foundation, stucco, and wooden parts of structure below outside grade level.
   d. Check and locate on diagram, cracks in foundation.
6. Recommendations: Explain in detail.
   a. Improper construction, and proper methods of repairing and correcting structural defects.
   b. Estimate time necessary for clean-up work, and general preparation of the structure for treatment.
   c. State conditions as to piling of repair materials, rubbish, etc. during reconstruction period.
   d. Accessibility to haul away debris, etc.

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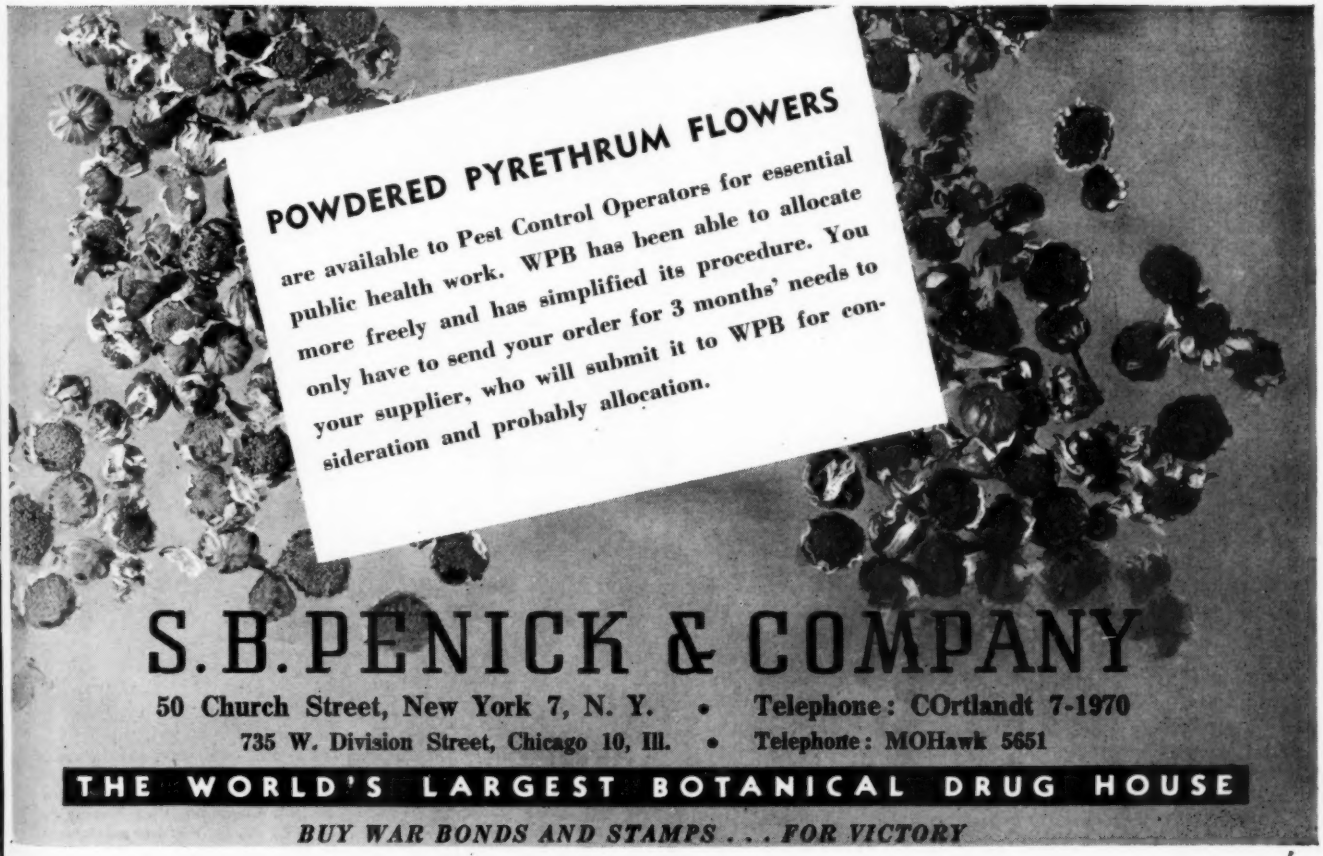
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New Fumigation Trailer in Operation

With the protection of foodstuffs from damage by insects, rodents and other pests becoming increasingly vital as supplies fall short of world demands, The Dow Chemical Company has placed in service a unique fumigation trailer designed to handle special fumigation problems and to aid in the development of new techniques and the improvement of existing practices.

With this equipment, R. M. Borg, fumigants division field service engineer, will work in conjunction with established industrial fumigators on special fumigation problems, and will cooperate particularly with government agencies, port authorities and the Canadian government. Among many new fields to be investigated, Mr. Borg declares, are the extermination of rodents in cold storage plants, fumigation of food processing plants and machinery by means of mechanical piping, and ship and barge fumigation.

R. M. Borg, field service engineer of The Dow Chemical Company's fumigants division, explains use of some of the equipment in a new fumigation trailer recently placed in service by the company to work on special fumigation problems.

Kept loaded and ready for instant action, the trailer is equipped to handle virtually every type of fumigation problem, and in addition to such standard fumigants as methyl bromide and chloropicrin, carries grain fumigant mixtures, soil fumigants and package line fumigants. Mr. Borg and the trailer will be working throughout the United States east of the Rockies and in portions of Canada, Dow announces.

DDT

The Department of Agriculture released the following information under date of June 3rd:

An ingenious and simple poisoning device that works automatically against certain types of vexatious mosquitoes does so by withholding a deadly dose of DDT until it is needed and then delivered at the time it will be most effective against newly hatched wigglers. The USDA reports this from the Orlando, Fla., laboratory of the Bureau of Entomology and Plant Quarantine, which has been rushing research efforts for protection of the armed forces against insect pests and insect carried diseases. The device takes advantage of the fact, established by scientific studies of the life habits of the insects, that mosquitoes of the Psorophora group have the habit of laying their eggs in grassy areas that are likely later to be flooded by heavy rains or rising streams and ponds. The eggs mature, and as soon as the land is covered by water, they are ready to hatch almost instantly and soon develop into biting adults. One species is known as the shaggy legged gallinipper; another is the Florida glade mosquito. Hatching in enormous numbers, these biters may be a terrible pest to troops, farmers, and others working outdoors. But treating broad areas in the short time between flooding and the biting period has been difficult. The new development permits making preparations in advance of hatching. The new device is a bottle containing a small quantity of DDT in oil. The bottle is partly buried in the soil in an area where hatching is likely. The bottle has an opening just above ground level. As soon as flood water rises to this opening the oil floats out and spreads a thin, deadly film to kill newhatched wigglers when they come to the surface. DDT, however, is toxic to fish and other forms of aquatic life. The conditions under which the new device may be used still remain to be worked out. The Bureau also expects to test the device in salt marshes and areas subject to flooding against other species of mosquitoes. DDT is not available for general or civilian use.

Florida Pest Control Operators Meeting

The above picture shows most of the group who attended the recent meeting of the Florida Pest Control Operators that was held on April 26-28-1945, at The University of Florida. In the front row from left to right are members of the faculty and others who participated in the program.

Officers and Directors of the Florida Pest Control Association from left to right, D. R. Barnhart, Director; F. DeL Clements, Vice-President; J. M. Roper, Director; J. P. Walker, President; W. G. Waldron, Director; W. A. Helms, Secretary-Treasurer.

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Stops and prevents termite entrance from parent soil colony. Used for treating foundation timbers, infested beams and sills. Soluble in water or may be used in dry form. Contains 75% arsenious oxide.

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Concentrated sodium arsenite solution. One gallon equivalent to approximately 5 pounds of Dry Sodium Arsenite. Used with equal effectiveness.

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George W. and Mrs. Dyar Commended by Cleveland City Council

An emergency resolution, recognizing and commending George W. Dyar and his wife, Grace E. Dyar on their accomplishments for the people and property of Cleveland in organizing and operating rat control programs, has been passed by the council of the City of Cleveland. Excerpt from the resolution, which appeared in The City Record (May 16), follows:

"That this council expresses the grateful appreciation of the citizens of Cleveland for the services rendered by George W. Dyar and Grace E. Dyar in the formulation and operation of the rat control programs and commends them on the outstanding accomplishments made, and extends to them best wishes for continued success in their endeavors."

Mr. Dyar, specializing in ratproofing and an Assistant District Agent of the Fish & Wildlife Service of the United States Department of the Interior, was placed in charge of Federal Rodent Control in the State of Ohio in October, 1942. He was then promptly loaned to the division of health, food and drug administration, City of Cleveland, to organize and operate the "first community rat control project in the U. S."

Ably assisting Mr. Dyar was his wife, Grace E. Dyar, Assistant Rat Control Expert, in the educational phases of rat control.

Now located in Hartford, Conn., the Dyars have opened an office for the Rose Exterminator Co. in that city.

NPCA Committee Studies Legislation

Members of the NPCA committee on Legislation from Milwaukee, Louisville, Chicago, Detroit, Cleveland, Atlanta, Hartford, Syracuse and elsewhere, meeting at the Hotel Pennsylvania in New York on June 8, 9 and 10, tackled the thorny question of legislation, past, present and future.

It was the consensus of the committee that insistent agitation for legislation was largely due to the rising accident toll and the desire to prevent disease.

It was the further consensus that, generally speaking, legislation, already passed or presently proposed, neither encompasses the fundamentals of practical pest control, the techniques of application, or what may be termed standard procedures. Because it was felt that such legislation is not entirely in the public, or industry, interest, fumigating, exterminating and rat control legislative suggestions were roughed out. These, after much further study and when finally whipped into shape, are to be made available as a guide to legislators on their request. The theme song remains that of education being more important than legislation.

A thumb-nail review of topics, discussed during the 3-day conference, includes: desirability of state legislation over city ordinances; rat proofing or rat stoppage; rat ordinances; comparative value between practical experience and scholastic training; standards; accident prevention; problems attendant upon anti-poison legislation where food products are kept. There were a host of others, of course. Much was accomplished at N. Y., more tangible evidence of which should manifest itself all in due time.

Footnotes

Of invaluable assistance to the committee in framing legislative suggestions, involving insurance and fumigation, were DAVE WEISBURGER of B. & D. A. Weisburger, and L. L. LEHRITTER of American Cyanamid and Chemical Co., respectively.

Making their debut at an NPCA meeting were the attractive teen-aged daughters of HENRY TURRIE and PETE BOHMAN and, before one could say Bill Buettner, they (the girls, not their daddies) received the Secretary's approval (kiss to you). Others looking in during the course of the sessions were MRS. JOHN VOGEL, MRS. TOM MAHON, MRS. HELEN BUETTNER and her pride and joy, TED (his first meeting).

Sessions were held Friday, Saturday and Sunday; morning, afternoon and evening. Saturday evening in particular was balmy; it was June; and New York with all its bright lights and allure was calling. WALTER McCLOUD couldn't resist the call. He moved to bring the meeting to a close, offered to finish his appointed duties up in his room. But all such shenanigans were promptly sat on by the Chair, the Chair being none other than "Bill" Buettner.

DR. JOHN OBERWAGER, of the New York City Department of Health, spoke informally at the committee dinner on Friday.

At the Sunday luncheon, GEORGE ELLIOTT, who is serving as editor of NPCA's forthcoming manual for PCO's, asked for name suggestions and price subscription data.

Exactly as related to us by one of the committeemen: "I didn't mind my horse not winning. I didn't mind his stopping to ask everybody: 'Which way did they go?' What really got me down was when he leaned over the fence, took a bit of my hot dog and complained because there was no mustard."

Ever-thoughtful JOHN MEDOFF eased the tobacco shortage when he showed up on Sunday afternoon and unloaded a large paper bag containing cigarettes and cigars.

There were no prepared papers or speeches as such. Conferees merely sat around a long, green-felt-covered table, with pad and pencil, exchanging views informally. When traffic became snarled, as might happen on occasion in any such gathering, "Bill" simply got up, noted that talks had now reached the "hodge-podge" state, and it wasn't long before traffic was again moving smoothly. To expedite matters, the group was divided into splinter committees, each being assigned the task of reporting on a specific phase of legislation. Later, these reports were submitted to the entire group for critical analysis and further discussion.

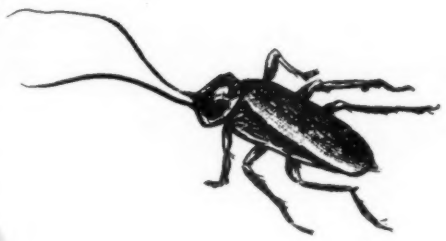
ATTENDANCE ROSTER

Walter S. McCloud, Chicago; M. R. Van Auken, Detroit; Henry Turrie, Milwaukee; Larry McKenna, Cleveland; J. Harvey Sturgeon, Louisville; Morton S. Prescott, Chicago; F. E. Bohman, Hartford; George R. Elliott, Worcester; I. B. Carncross, Syracuse; Stanley L. Lind, Chicago; Herbert Meyer, New York City; Fred J. Bowers, Rahway; John G. Vogel, Philadelphia; Leon A. Moore, Utica; Edward N. Goldey, New York City; Philip Mayer, Jr., New York City; Sidney Wimmer, New York City; Stefan Rohdie, New York City; Joseph Finneman, New York City; Thomas H. Mahon, Brooklyn; John K. Medoff, West New York; David McAlindin, Hoboken; Theodore Oser, Atlanta; William O. Buettner, Brooklyn.

Reprints of Articles

Requests have been made from time to time relative to reprints of articles being available. This publication will make possible reprints of any article in this issue if orders are received within 10 days of receipt of this publication. Charges are based on the length of the article.

Insecticide Materials



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1. That you practice safety-first in your control operations at all times.
2. That you carry adequate insurance coverage, always.
3. That you consult us, without obligation, for a critical analysis of your insurance requirements.

In business for over a quarter of a century, B. & D. A. WEISBURGER has served a larger number of PCOs, and placed a greater volume of pest-control insurance, than that of any similar firm in America. . . . This invaluable specialized experience is yours for the asking.

Policies in all representative

AMERICAN STOCK COMPANIES IN ALL STATES

Coverage for:

Public Liability — Workmen's Compensation
Auto Liability — Products Liability
Property Damage — Accident & Health
All Allied Lines

Also Life Insurance and All Forms of Employee Insurance Plans

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Consult us now, and avoid possible worry later! Remember, there is no substitute for expert advice!

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POSITIVE TERMITE CONTROL with a 4-STAR LEADER

TERRA TOX

PENTACHLOROPHENOL BASE AS RECOMMENDED BY U. S. GOV'T.

Why pentachlorophenyl? It is one of the most effective chemicals against termites as proven by the latest tests of the U. S. Government. When applied as recommended, TERRATOX treatment can be expected to be effective for at least FIVE years!

HIGHLY CONCENTRATED TO SAVE SHIPPING COST and STORAGE SPACE

When you buy TERRATOX you do not pay for shipment of water or oil thinner, nor do you have this added bulk to store. Add thinner when ready to use TERRATOX. Available in 5, 30 and 55 gal. containers. (*One gallon containers temporarily unavailable due to wartime restrictions.*)

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Both solutions are equally effective. You don't have to fret with one "all-purpose" solution—you choose the one that fits your purpose to assure a successful job!

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Send NOW for the TERRATOX BULLETIN which gives you full details, application information and prices that insure profitable operation.

WOOD TREATING Chemicals Co.

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WHAT'S NEW IN PEST CONTROL-PERSONALS

Effective July 1, 1945, Arizona and Minnesota have new State laws regulating the manufacture, sale and transportation of economic poisons.

RETIRES—Chief of California's Bureau of Chemistry, Department of Agriculture, DR. ALVIN J. COX, entered the period of automatic retirement as of July 1st under the California Civil Service Act. Since June first he has been on vacation at his home in Palo Alto. A State Civil Service Examination is to be given to choose a successor. In the interim, Mr. Allen B. Lemmon is to be in charge of the Sacramento office.

MARRIED—Miss Helen Laing, daughter of Mrs. Robert White Laing and the late Bob Laing, was married to Mr. Chester Zohn on May 2 at Cleveland Heights. Helen is the sister of Miss Barbara Laing who operates the Laing Ext. Co., Cleveland, in conjunction with her mother "Pat", a former director of the NPCA. Congratulations to the Zohns and the Laings and the best of all good wishes.

Chemical & Exterminating Company have moved their New York office from 299 Broadway to modern and enlarged office located at Broadway and 138th St. H. J. Jacobson can well be proud about the reception given at the opening of the new office on June 2nd. The best wishes of the industry are extended. Chemical & Exterminating Company also have offices at Newark, Paterson, Long Branch, Plainfield and Dover in New Jersey and in Jamaica, N. Y.

The I. B. Carncrosses and George Dummittses of Syracuse, N. Y. insist that the brief hour and a little more between Syracuse and New York City by plane will serve as a source of encouragement to spend weekends in the big city and visits across the river from Manhattan to inspect the tree that grows in Brooklyn.

BOB BLOCK, of the Greene Exterminating Service, Inc., Brooklyn, N. Y. is now stationed in Giessen, Germany, 40 miles north of Frankfort-on-Main. Just how long he will remain there is, of course, not known but he is well and sends his regards.

COMING EVENT—The TOM MAHONS are expecting a little 'Mahon' (spelling not guaranteed but you get the point). Their first. Pop-to-be, as if you didn't know, is the Secretary's right-hand bower.

Michigan Pest Control Operators Association held an outdoor party at LaBelle Resort, Gull Lake, Mich. on June 27. Invited were all those employed in pest control service and manufacturers' representatives. Entertainment consisted of a buffet luncheon, an afternoon program of boating, games, swimming, etc., and an evening banquet with entertainment, followed by dancing to the music of a fifteen-piece band.

A good time was had by all.

JOHN G. VOGEL, Vogel-Ritt Co., Inc., has graduated from the Lawrenceville School, Lawrenceville, N. Y. We are certain that Junior has been as much of a credit to his school as John has been to the Industry. Congratulations!

STABLE ROTENONE INSECTICIDE—A method of making a stable rotenone insecticide through the use of a clear potash soap with an aqueous solution of potassium pyro-phosphate added to form a jelly was recently announced.

—Inside News.

The Federal Trade Commission on May 17th entered a stipulation in relation to a rat exterminator (Stipulation 03283).

Feed Supplies, Inc., and Killer-Diller Corporation, both of Milwaukee, engaged in the sale of a preparation designated Kil-Balm, stipulated with the Federal Trade Commission that they will discontinue representing that the product will rid buildings or homes of rats or mice or cause such rodents to crawl outside to die.

The stipulation was also entered into by Arthur Towell Incorporated, Madison, Wisconsin, an advertising agency which prepared and disseminated advertisements for Kil-Balm.

We are sorry to hear that William Hogan, of Pasadena, California, is very sick in the hospital due to hemorrhages in his stomach that reduced his blood supply.

Bill edits the PCO News for the California Association.

We hope that Bill will soon be out of the hospital and back on the job.

DODGE & OLCOTT ACQUIRED BY U.S.I.—Effective June 1, 1945, the assets and business of the Dodge & Olcott Co., the country's oldest and one of the largest essential oil companies, was merged with those of U. S. Industrial Chemicals, Inc. The former will continue to operate as a separate entity under the Dodge & Olcott name and retain its present management, headed by Francis T. Dodge, president, and Charles E. Myers and V. H. Fisher, vice presidents. Continuing in charge of the department handling insecticide materials will be Russell B. Stoddard. No changes are contemplated in the organization. The management and personnel will continue. One of the developments of Dodge & Olcott is in the production of pyrethrum extract for use in aerosol bombs by the armed forces.

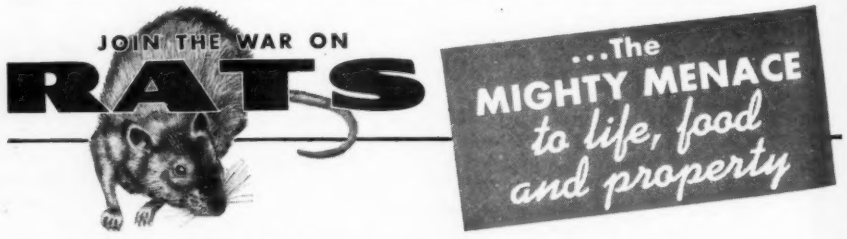
COMBAT COSMETIC CREAM—A cosmetic cream, employed by Navy gun crews, and GI's using bazookas and flame throwers to prevent burns, will probably have a post-war use by community fire departments. Applied like a beauty mask, the cream dries quickly and can be removed easily with soap and water.

SQUIRRELS EAT LEAD—Just what gray squirrels find so palatable in a lead cable sheath that they go around gnawing holes in it is something that the lovers of these little rodents have never told us, but the damage they are causing to telephone and telegraph lines is proving so irritating that Secretary Ickes is going to try to change their appetite.

Efforts to discourage the squirrels from chewing holes in the lead coverings of aerial cables have all been a failure. Now the Fish and Wildlife Service, under Mr. Ickes, has been called in on the job and is experimenting with a coating concoction consisting of asphalt mixed with large amounts of aloe which will be painted over the leaded joints. The aloe, ancient remedy for thumb-sucking by infants, imports an extremely bitter taste and has proved the best thing tried yet. It hasn't discouraged the squirrels completely, though, and the service is still experimenting.

—Oil Paint and Drug Reporter.

CHROMATED ZINC CHLORIDE PROLONGS FENCE POST LIFE—Chromated zinc chloride can now be used to make non-durable fence posts, such as those made of the lower grades of green pine, relatively lasting. No one knows how long posts treated with this chemical will last, but a southern college reports that a recent examination of sap pine posts, which have been in the ground nearly six years, showed



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Thousands use and praise KILLER-DILLER. We can show you numerous enthusiastic letters from satisfied users.

KILLER-DILLER is a liquid that attracts rats and mice by its pleasant, sweet odor. They sip it...they like it...they die. KILLER-DILLER is easy and economical to use. Sold on a money-back guarantee. Order today!

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Retails at	
6-oz. Bottles	$ .50 each
16-oz. Bottles	1.00 each
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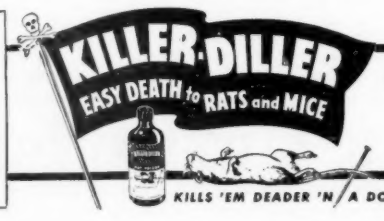

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THE ODORLESS DEODORANT

Acclaimed by Pest Control Operators from Coast to Coast as a Wonderful New Development in handling ODOR problems.

SAFE - ECONOMICAL

Prices and full information on request.

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Guaranteed to Outwear and Outlast any Other Hose or Money Refunded

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MAGIKIL ANT BAIT JELLY

Easy TO USE

KILLS ANTS

CONTAINS THALLIUM SULPHATE

Packed in Convenient Service Containers

ANT TRAPS, 1, 3 & 7½ oz. Tubes 10 Lb. Jars

Used professionally it assures customer satisfaction.

Preferred by discriminating PCO's.

For safety in service work use MAGIKIL ANT TRAPS.

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THERE'S A REASON FOR POPULARITY OF ACME GAS MASKS

Pest Control Operators have made the Acme No. 4 Gas Mask popular in the fumigating industry. They have proved by the constant use of these masks, that it pays to wear a Safe, Dependable, Comfortable Acme Gas Mask.

With the Acme No. 4 Gas Mask and Canister you get protection against any fumigating gas, or combinations of gases. Write for FREE literature and prices.

ACME PROTECTION EQUIPMENT CO., INC.

Manufacturers of Respiratory Protective Devices

3616 LIBERTY AVENUE PITTSBURGH, PA.

BUY BONDS TO LICK THE JAPS

85% sound. Untreated posts are usually destroyed in two years.

—Inside News.

ANOTHER DDT STORY—Added to the many remarkable stories about the effectiveness of DDT in killing bugs is the following by Lt. Col. A. L. Ahnfeldt, Office of the Surgeon General of the United States Army.

In 1942 the Surgeon General's office first saw the potentialities of DDT . . . Two medical officers were taking some DDT powder to an isolated detachment of our troops. They were captured by some Bedouins and taken before the chief. It was a pretty tight spot. In desperation they told the chief that they were carrying a magic powder. The chief wanted to see it so the medical officers dusted his robes with DDT. The Americans said that in a few minutes the chief relaxed and smiled and the next day set them free. For the first time in that chief's life he had enjoyed a restful night's sleep.

—Chem. and Eng. News.

TYPHUS BARRIER SET UP AT RHINE —Allied Headquarters announced on May 26 that a cordon sanitaire, to prevent the spread of typhus and other contagious diseases from conquered Germany to the rest of Europe, was being set up along the Rhine.

The main objective of the quarantine is the body louse, which is prevalent in Germany and which at various stages in history spread epidemics throughout Europe.

—N. Y. Post.

FRIAR THOMPSON, JR. JOINS R. J. PRENTISS & CO., INC. AS MANAGER OF INSECTICIDE DIVISION

R. J. PRENTISS & CO., INC., New York, N. Y., importers and processors of botanical drugs, chemicals, and insecticides, announce the appointment of Friar Thompson, Jr. as Manager of the Insecticide Division of the Company.

Thompson comes to Prentiss from Hercules Powder Company, where for 17 years he has handled the development of Naval Stores products for the Insecticide and Fungicide Industry. He also serves on the Board of Governors of the National Association of Insecticide and Disinfectant Manufacturers. Thompson holds a B.S. in Agriculture from the University of Georgia and a M.S. in Entomology from Rutgers.

WITH THE COLORS: After completing his freshman year at Massachusetts State College, WILLIAM R. BUETTNER has been inducted into the Armed Forces as a private in an infantry regiment (army intelligence, scouting and reconnaissance). Billy, an ardent camera fan, is stationed at a camp somewhere in the U. S., undergoing basic training. It is hardly necessary to add that Billy is the son of NPCA's peerless secretary.

THALLIUM CHEMICALS UNDER ALLOCATION—In view of recent heavy demands by the military for thallium sulphate for use in rat control in European areas and in the Pacific war theatres, the War Production Board placed thallium chemicals under the control of Schedule 107 of Order M-300, the general chemicals allocations order, WPB has reported. Although the heavy demand is for thallium sulphate, it was necessary to place all thallium chemicals under allocation control because thallium sulphate is produced from other thallium chemicals, WPB explained.

The need is especially heavy in these foreign areas because rats carry insects that transmit diseases such as typhus and schrub typhus, WPB said. Thallium sulphate has been used in the United States for rodent control in the prevention of plague and also against field rodents, for crop protection. WPB said that because of limited production facilities, an attempt is being made to purchase supplies of thallium sulphate in some of the liberated European areas.

Suppliers' applications (Form WPB-2947) for authorization to use or deliver thallium chemicals should be submitted to WPB at the earliest possible date in order to be considered for June allocations, WPB emphasized. Schedule 107 contains a monthly small-order exemption, for laboratory and reagent use only, of one-eighth of a pound each of thallium acetate, thallium chloride, thallium formate and thallium sulphate, the chemicals controlled by the order.

TERMITE OPERATORS FINED

J. H. Tyrone and A. B. Wingo, charged with having engaged in the termite business without being licensed as required by Act 394 of 1939 (State of Arkansas), have pleaded guilty and were given fines which with costs totalled $102.30, according to information received from Deputy Prosecuting Attorney Cul. L. Pearce of Searcy, Ark. Under the provisions of Act 394, all termite or other pest control operators must secure licenses from the Plant Board, which are issued only to such applicants as can demonstrate their ability to do satisfactory work.

The two men, operating as the Delta Termite Company of Blytheville, Arkansas were arrested near Searcy on March 30. Plant Board inspectors who afterwards examined several houses which they had treated, reported that termites were still present in some of the houses, and that others were apparently not infested at the time they were treated, contrary to the representations made by the men to the owners. Prices charged for treatment ranged from $150 to $250 per building.

LOCAL ORGANIZATION NEWS

Eastern Pennsylvania Pest Control Association

Realizing the need for closer cooperation and systematic planning to meet their obligations in the post war economy, and to prepare for united action on local and regional problems, a representative number of pest control firms, functioning in the State of Pennsylvania, East of the Susquehanna River, have recently organized the "Eastern Pennsylvania Pest Control Association".

At an earlier meeting this year the following officers had been elected:

President: W. C. Sharp, Smithereen Exterminating Co., 1405 Race St., Phila. 2, Pa.

Vice-President: J. B. Muth, Western Exterminating Co., 3909 Baltimore Ave., Phila. 4, Pa.

Vice-President: D. L. McCullough, Sanitary Exterminating Co., 40 West 4th St., Williamsport, Pa.

Treasurer: York King, Jr., Rose Exterminator Co., 1022 Arch St., Phila. 7, Pa.

Secretary: R. H. Bauer, Bauer Exterminating Co., 4121 Worrell St., Phila. 24, Pa.

Director: (3 years) Arthur H. Richards, A. H. Richards & Sons, Wilkes-Barre, Pa.

Director: (2 years) Martin Meyer, Theodore Meyer, Est., Philadelphia, Pa.

Director: (1 year) John T. Kavanaugh, Vogel-Ritt, Inc., Philadelphia 3, Pa.

The association held their regular meeting on May 15th, at the Lorraine Hotel in Philadelphia, where a fine dinner had been prepared for them. Those present were as follows:

Thomas H. Mahon, National Pest Control Assn., Brooklyn, N. Y.

Dr. James C. Munch, Consultant Toxicologist, Philadelphia.

W. C. Sharp, Smithereen Exterminating Co., Philadelphia.

Joseph B. Muth, Western Exterminating Co., Philadelphia.

John G. Vogel, Vogel-Ritt, Inc., Philadelphia.

J. T. Kavanaugh, Vogel-Ritt, Inc., Philadelphia.

Martin Meyer, Theo. Meyer Est., Philadelphia.

Geo. Daudert, Theo. Meyer Est., Philadelphia.

J. K. Montgomery, Theo. Meyer Est., Philadelphia.

Joseph R. Hynack, Shur-Way Exterminators, Scranton, Pa.

Mary E. Hynack, Shur-Way Exterminators, Scranton, Pa.

Aubrey F. McNeil, Aubrey F. McNeil, West Chester, Pa.

Arthur H. Richards, A. H. Richards & Sons, Wilkes-Barre, Pa.

Arthur Topping, A. H. Richards & Sons, Wilkes-Barre, Pa.

D. L. McCullough, Sanitary Ext. Co., Williamsport, Pa.

J. H. Hoeffler, American Cyanamid Co., New York.

H. Homberg, Abalene Ext. Co. of New Jersey.

E. Buhlat, Abalene Ext. Co. of New Jersey.

Mr. and Mrs. R. De Reamer, Abalene Ext. Co. of Pennsylvania, Inc.

E. H. Larisch, Abalene Ext. Co. of New Jersey, Inc.

Mr. and Mrs. M. Heydenreich, Abalene Ext. Co. of New Jersey, Inc.

Alice Carson, Abalene Ext. Co. of New Jersey, Inc.

T. E. Harkin, J. C. Ehrlich Co., Reading, Pa.

Arthur Hammel, J. C. Ehrlich Co., Reading, Pa.

Peter J. Salino, J. S. Ehrlich Co., Reading, Pa.

S. J. Hermann, U. S. Fumigating Co., Philadelphia.

H. S. Boohar, Boohar Chemical Co., Philadelphia.

W. Cholerton, A.B.C. Ext. Co., Philadelphia.

H. R. Isherwood, Antimite Co., St. Louis, Mo.

R. H. Bauer, Bauer Ext. Co., Philadelphia.

Charles Griesbach, Bauer Ext. Co., Philadelphia.

Russell Bauer, Jr., Bauer Ext. Co., Philadelphia.

The meeting was successfully conducted under the able chairmanship of President "Bud" Sharp, and an excellent job of reporting and recording was done by Secretary R. H. Bauer. The highlight of the evening was an address by Dr. James C. Munch, formerly of the U. S. Fish and Wildlife Service, who talked on the toxicity and antidote of old and new poisons used by the Pest Control Industry.

President Sharp then appointed the following committees for the ensuing year:

Public Relations Committee: J. G. Vogel, Chairman; Byron Kaufmann, Sig Hermann.

Bid Specifications Committee: J. T. Kavanaugh, Chairman; D. L. McCullough, York

USE

PRENTISS' FORTIFIED RED SQUILL

FOR RODENT CONTROL

STANDARDIZED
ACTIVATED
FORTIFIED
EFFECTIVE

R. J. PRENTISS & CO., INC.
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PHOSPHOROUS PASTE

FOR ROACHES and RATS

SINCE 1874

J-O Phosphorous Paste is so compounded as to eliminate the hazard of fire and possesses advantageous qualities peculiar to itself. A properly made **Phosphorous Paste** such as **J-O** is absolutely safe to use. It cannot burn or set fire to other substances.

Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

For all species of roaches, this product is **UNEXCELLED.**

JOHN OPITZ, INC.
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Manufacturers of Exterminating Products Since 1874

MOVIE FILM

A remarkably stirring inspirational educational film; 106 scenes, 52 titles, 800 ft., 16 mm black 7 white silent, requiring 30 minutes to show.

The cast-in destructive action; moths, buffalo and black carpet beetles, powder post beetles, cockroaches, bedbugs, fleas, termites, ants, bats, rats, mice, etc.

Teach sales and service men the easy way.

Gain prestige and appreciation — build steady profitable business by showing film to Health, Food, and Sanitary Inspectors, men's service and women's clubs, associations and organizations, real estate boards, hotels, restaurants, groceries, groups in small towns, etc. $110.

Send for booklet

HENRY TURRIE
522 West North Avenue, Milwaukee 12, Wisconsin

EXTERMINATORS CHEMICALS

RUMETAN
ZINC PHOSPHIDE
FOR RAT CONTROL

With thallium sulphate difficult to obtain, try RUMETAN . . . the ideal poison for Rats, Mice and Mole Crickets. Effective and economical. Write for details.

Pfaltz & Bauer, Inc.
EMPIRE STATE BUILDING, NEW YORK

King, Jr.

Membership Committee: Martin Meyer, Chairman; Walter Boohar, Arthur Hammel.

Legislative Committee: Martin Meyer, Chairman.

Program Committee: John G. Vogel, Chairman; Martin Meyer, Wm. A. Heydenreich.

The meeting was then addressed by John Vogel who pointed out that a national convention this year was highly questionable on account of travelling restrictions, and he suggested that this regional group at its meetings this year, take up such subjects as would normally be on the program of the national convention, such as Ethics, Cost Keeping, Office Forms, Contracts and Agreements, Insurance, Advertising and Labor Relations.

The next meeting decided upon will be held the early part of September at Reading, Pennsylvania, and the principal topics for discussion will be "Ethics" and "Cost Keeping". Mr. Vogel will endeavor to secure a speaker from the Better Business Bureau to speak on the subject of "Ethics".

Tom Mahon, Assistant to the Secretary of the National Pest Control Association, was greeted with a great deal of enthusiasm, especially when he extended greetings from Bill Buettner who, unfortunately, was prevented from making a personal appearance.

The programs mapped out for future meetings are designed to discuss the various complex problems which the industry must solve when it begins to reconvert to peace time business.

New England Pest Control Association

The June meeting of the New England Pest Control Association was held on the fourth of the month at Hotel Lenox, Boston, Mass. President Lester West presided and conducted a brief business meeting before William O. Buettner, Secretary of the National Pest Control Association, gave the principal address.

Secretary Kenneth Cook submitted the secretary's report and Treasurer Bartlett W. Eldredge emphasized that all 35 members had paid their dues in full for 1945 and indicated a balance in the treasury of over $800.00. George R. Elliott told of the surprise Half-Century Birthday pilgrimage made to Hopington to honor George B. Lay and Bart Eldredge reported as to the progress of proposed Senate Bill 515.

"Bill" Buettner held forth in his usual inimitable style stressing in detail the current supplies and equipment situation as well as Post-War activities and legislation. Necessity for standards of procedures being followed by the industry were discussed in detail. There then followed questions and answers. Other guests who spoke briefly were Dr. Roy Feemster, Director, Division of Communicable Diseases, Massachusetts State Health Department and Dr. Charles E. Renn, Division of Sanitary Engineering of the same department. George B. Lay, Regional Agent of the U. S. Fish & Wildlife Service also spoke of developments in rodent control.

On June 5th a committee of the New England Pest Control Association appeared before the Ways and Means Committee of the Massachusetts State Senate to speak on behalf of the proposed Senate Bill 515. It is expected that the bill will pass both houses of the State Legislature substantially in the following form:

SENATE—NO. 515.
THE COMMONWEALTH OF MASSACHUSETTS
AN ACT REGULATING THE USE OF POISONOUS GASES, LIQUIDS AND SOLIDS FOR KILLING VERMIN

WHEREAS, The use of poisonous gases, liquids and solids should without delay be made subject to regulation as provided by this act, therefore it is hereby declared to be an emergency law, necessary for the immediate preservation of the public health and safety.

BE IT ENACTED BY THE SENATE AND HOUSE OF REPRESENTATIVES IN GENERAL COURT ASSEMBLED, AND BY THE AUTHORITY OF THE SAME, AS FOLLOWS:

Chapter one hundred and eleven of the General Laws is hereby amended by inserting after section one hundred and eighty-six, as appearing in the Tercentenary Edition, the following section:—

Section 186A. No person shall engage in the use of poisonous gases, liquids, or solids, for the purpose of killing insects, rodents or other vermin, within a building, as such term is defined in chapter one hundred and forty-three, or on or within a water craft, without first obtaining from the department a license authorizing the use of such materials and the payment therefor of an annual fee of five dollars. Every such license shall be valid for the term of one year from its date, but may, after a hearing, be suspended or revoked by the department for cause. Whoever, being required to be licensed under this section, shall, without being so licensed, engage in the use of poisonous gases, liquids or solids, for the purpose of killing insects, rodents, or other vermin, shall be punished by a fine of not more than two hundred dollars or by imprisonment of not more than three months, or both.

The department, in each instances, after notice and public hearing, shall make, and may amend, suspend or revoke, rules and regulations relative to the use of such poisonous substances and relative to the persons authorized to use the same. Such rules and regulations shall be in conformity with the generally accepted scientific standards of practice as relate to fumigation and to pest elimination, as the case may be.

This section shall not apply to the use of liquid or solid insecticides or rodenticides by an individual in his home, or in his place of business unless food is stored, prepared, served or kept for sale therein, but in no event shall lethal gas for fumigation be used without a license under this section, except in agricultural or horticultural persuits, or both.

Florida Pest Control Association

At the successful two days' meeting held at the University of Florida April 27-28, there was organized The Florida Pest Control Association. A charter membership of some thirty or more firms joined the association. Officers elected were:

President, J. P. Walker, Walker Chemical & Exterminating Co., Orlando, Florida.

Vice-President, F. deL Clements, S. P. & M. Service, Ft. Lauderdale.

Secretary-Treasurer, Walter A. Helms, Orkin Exterminating Co., Jacksonville.

Directors: David R. Barnhart, D. R. Barnhart Co., Daytona Beach; J. M. Roper, Pan American Exterminating Co., Miami; W. G. Waldron, Waldron Exterminating Co., Sabastian.

One of the immediate matters for consideration is the proposed bill that would regulate the pest control industry known as House Bill 597. There are several clauses of the proposed bill which would not be acceptable to the industry.

Dr. John T. Creighton, Head Department of Entomology, University of Florida was elected as Honorary Member of the association.

It is contemplated that there will be another state meeting the latter part of the year to perfect organization.

Alabama Pest Control Association Quarterly Meeting

Members of the Alabama Pest Control Association gathered in Montgomery, Saturday, June 9, 1945, for a half-day business session in the Greystone Hotel.

Some thirty pest control operators and others interested in our work met to hear several interesting talks, each of which was followed by an open clinic composed of questions and answers.

Professor J. M. Robinson, Head of the Department of Entomology of the Alabama Polytechnic Institute, Auburn, Alabama, spoke on termites. Among other items was brought up the question of the effectiveness of arsenical preparations on termites in view of the ability of the termite to regurgitate his food. Also under discussion was the value of creosote in termite control, it being the contention of some that creosote is no deterrant to termites.

Dr. J. L. Bowman, Montgomery Health Officer, spoke on rats and typhus; his talk was followed by talks by two members of his department, namely, Mr. J. O. Rittenberry and Mr. J. O. Webb. All three pledged their support to commercial pest control operators in their efforts to alleviate the serious typhus situation that confronts this region. Dr. Bowman stressed the need of continued and even increased cooperation between public health officials and pest control operators, and expressed his gratification upon learning that the National Pest Control Association is even now in the process of preparing a suggested model building and sanitary code that can be utilized by municipal health departments in their efforts to promote a higher degree of sanitation. Mr. Rittenberry and Mr. Webb expressed the view that the rat situation is definitely quite better in Montgomery and that the typhus situation shows no tendency to get worse.

A very interesting discussion on DDT was made by Professor L. E. Guyton of the Department of Entomology of Alabama Polytechnic Institute. Professor Guyton, who is an enthusiastic experimenter, has completed extensive investigation of many types of pests with DDT both in liquid and powder form. Professor Guyton stated that DDT in powder form has been definitely and amazingly effective in controlling bedbugs, American cockroaches, oriental beetles, brown-banded roaches, although he is not ready to give his opinion on its effects against the German roach or waterbug as it is commonly known. He says that the liquid DDT is very effective against bedbugs, flies and honey bees. He has not found it necessary to use a stronger percentage of DDT than 10% in order to obtain excellent results.

Mr. B. P. Livingston, Head of the Bureau of Industry of the State's Department of Agriculture, spoke briefly on legislation.

The meeting was presided over by A. S. Krawcheck, President, and order of business was carried forward by C. W. Bentley, Secretary and Treasurer.

Following adjournment, those in attendance had luncheon in a private room of the hotel. The next meeting is scheduled for September 8, 1945 at Auburn, at which time Professor Robinson and Professor Guyton and their entomological staff at Alabama Polytechnic Institute will play host. Sessions will be held in the Agricultural Building of the college.

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II. Plants as Housepests. Bacteria, Molds which live in the house. Timber rot, fungus. What plants do to housepests and what housepests do to plants and plant products. Pages: 62.

III. Lower Animals. Protozoa, worms, snails, millepedes, spiders, mites, many others, as far as they are housepests. Pages: 112.

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FUMIGATORS EXAMINATION

Analysis of examination papers from a written examination taken by a number of PCO's and others who attended a school on insect and rodent control are contained in this news bulletin. Bulletin also publishes a list of questions people ask PCO's about Cyanogas and the answers thereto.

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WRITE PESTS—BULLETIN 43-T.

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The Victor Gladiator has been designed especially for professional use by public health officers, sanitary officers of the armed forces, and pest control operators. It is of rugged construction and is particularly adapted to outdoor use; especially recommended for the tropics and on shipboard, not readily affected by continuous contact with moisture.

Actual size 7⅛x3⅝x1½". Weight, packed ½ dozen, 4½ lbs. Weight, packed 6 dozen, 29½ lbs.

WRITE PESTS—VICTOR.

PRESERVATION OF MILLWORK AND OTHER DRY WOOD PRODUCTS

Bulletin discusses composition of Permatox B Concentrate and its application in the preservation of millwork and other dry wood products.

WRITE PESTS—PERMATOX 43-B.

RATS CAN'T RESIST THE NEW BAIT

VEGEX
DRY
GRAVY
as effective
as the best beef

Simply add water—boil up once—add poison—and it works like magic. Keeps indefinitely—needs no refrigeration. Safe to use.

One five-pound package makes five-gallon mixture—costs only four dollars. Four five-pound packages—fifteen dollars. Available in five-pound packages only.

VEGEX COMPANY
175 FIFTH AVENUE NEW YORK 10, N. Y.

Inquiries invited from pest control operators interested in New Big 6 Line of Wizo Moth Killer Vaporizers and Crystals. Catalog describing each product fully and prices available.
WRITE PESTS—ELKAY.

FILM OF VALUE TO PCO

Circular describes a vivid action film of greatest value to every PCO and opportunities it affords PCO to build good will and better public relations.
WRITE PESTS—WIL-KIL.

ANT BAIT

Circular describes a jelly ant bait with Thallium Sulphate as its toxic ingredient. Comes packed in sizes convenient for resale or professional use. Sample tube on request.
WRITE PESTS—LETHELIN.

Phosphorous Paste killing power; baits, combinations, amounts for the control of roaches, mice, rats are discussed.
WRITE PESTS—OPITZ.

FUMIGATION SAFETY RULE

A review of fumigation accidents of record for 1943 shows that oversight or disregard of rule to lock all doors and accessible windows, failure to place warning signs thereon and failure to post guard during fumigation account for approximately 20% of the accidents. Bulletin discusses ways and means to eliminate accidents of this nature.
WRITE PESTS—AC No. 80.

Fortified Red Squill circular, which includes bait chart, describes a Fortified Red Squill powder activated and standardized to meet recommendations of the Fish & Wildlife Service for a minimum lethal dose of 500/600 mg/kg of rat.
WRITE PESTS—PRENTISS.

SODIUM SILICO FLUORIDE

Bulletin describes sodium silico fluoride product with proper density. Effective manner of testing for presence of HCN after ventilation also discussed.
WRITE PESTS—AC 70.

Fumigation manual. 76-page manual describes safe handling and working with "Cyanegg" and on fumigation procedure and insect control. Illustrated.
WRITE PESTS—DuPONT.

GAS MASKS—RAT CONTROL PROGRAMS

Bulletin offers some pertinent suggestions regarding gas masks and how to keep them in perfect condition. It also discusses rat control programs and what the PCO can do to further them.
WRITE PESTS—AC 82.

NEW ANT TRAP

Manufacturer claims many new features such as no turning or twisting necessary; four openings; larger trap; contents ½ greater than any other competitive brand.
WRITE FOR YOUR FREE SAMPLE OF ANT TRAP TO NOTT, c/o PESTS.

Red Squill Rat and Mouse Killer

Booklet describes Red Squill rat and mouse killer made up in convenient package form for resale to public. Also illustrated are resale packages of dog repellent, moth killer, etc. Included in the booklet is reprint of an article on Red Squill by Leonard R. Parkinson, Agr. Exp. Station, Massachusetts State College.
WRITE PESTS—OHIO.

CALCIUM CYANIDE FOR RAT CONTROL

36-page booklet contains excerpts from official publications and reports of health officers throughout the world regarding use of calcium cyanide in the control of rats. The widely differing conditions surrounding infestations, and the specific types of control for each, which are described, will serve as suggestions to health officers and others in solving similar problems.
WRITE PESTS.

THE ACTIVATING EFECT OF PYRETHRUM UPON THE GERMAN COCKROACH

Research material prepared by John M. Hutzel, of the Ohio State University, Columbus, Ohio in cooperation with the Kenya Pyrethrum Extension Service, Inc., N. Y. Supervised by Professor F. L. Campbell.
WRITE PESTS—PYRETHRUM.

INSECT POISONING AGENTS

"Thanite, quick death to insects" is a 12-page booklet presented in Basic English with a view to international use. It discusses the development and applications of the product.
WRITE PESTS—HERCULES.

ELECTRIC FANS HAVE SEVERAL USEFUL FUNCTIONS IN FUMIGATION WORK

Ways in which fans may be used to promote circulation and penetration of gas during fumigation are described in this bulletin.
WRITE PESTS—AC 84.

BIRD REPELLENT

Circular describes product which manufacturer claims will serve as an effective repellent against pigeons, starlings, bats, dogs, cats, rats, mice, woodchucks, moles as well as crawling and flying insects that prey upon plantings and seedlings.
WRITE PESTS—PX.

BOX CAR FUMIGATION

Folder describes box car fumigation with methyl bromide, giving details as to: car seal, applicator arrangement, methyl bromide application, dosage, exposure period, temperature, aeration, precautions.
WRITE PESTS—DOW.

PRESERVATION OF LUMBER, POLES, POSTS, PLYWOOD WITH PENTACHLORPHENOL

This bulletin gives a brief summary of the properties, use to date, and recommendations for the preservative treatment of lumber, poles, posts, and other forest products with Permatox A. This product, it is stated, has shown outstanding promise as an effective and permanent oil preservative for many wood products. Set forth briefly also, are recommendations for the effective preservative treatment of lumber, poles, posts, and other forest products with Permatox A, based upon experience to date.
WRITE PESTS—BULLETIN 43-A.

WOOD PRESERVATIVES

Discussed are several products for the control of decay, blue stain, termites, powder post beetles, swelling, warping, checking, shrinking, moisture absorption, grain raising. Illustrated.
WRITE PESTS—PRESERVATIVES (W).

PIGEON-PROOFING

Folder describes pigeon-proofing invention which manufacturer claims will completely and decisively eliminate the pigeon nuisance. In use by real estate companies, churches, government buildings, etc.
WRITE PESTS—STANLEY.

FIRST AID AND TREATMENT FOR METHYL BROMIDE EXPOSURE

This valuable booklet, prepared by Dr. H. H. Gay, Medical Director, The Dow Chemical Company, Midland, Mich., outlines first aid and treatment for Methyl Bromide exposures. Contents are based upon what is believed to be sound medical practice. Digest follows: properties of Methyl Bromide, symptoms of Methyl Bromide exposure, first aid, suggested treatment by a physician, skin contacts with Methyl Bromide. Copy may be had by writing Dow direct, or
WRITE PESTS—GAY.

SAFETY IN FUMIGATION WORK

Fumigation Safety Rule No. 1; namely, "Vacate entire building even though only part is fumigated, as well as adjoining buildings into which gas may penetrate" is discussed in this bulletin.
WRITE PESTS—AC No. 78.

ALL-PLASTIC GOGGLE

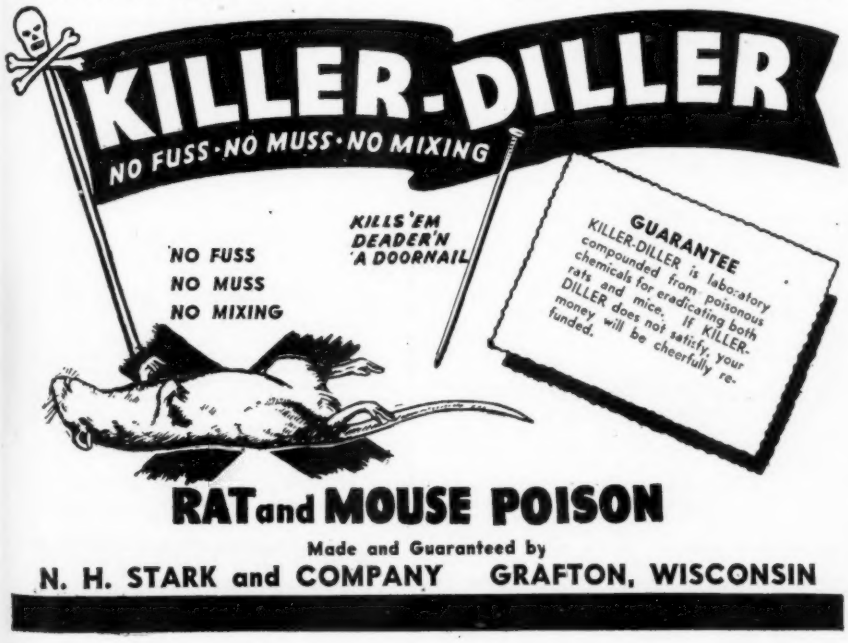
Circular describes a new lightweight, all-plastic goggle which provides comfortable, durable protection for the eyes. The individual eye cups are moulded to fit the facial contours, giving a close yet comfortable seal around eye orbits, according to the circular. Particularly useful for spraying in termite control, as well as heavier bedbug spraying operations, to prevent direct sprays from getting into the eyes themselves—available in different models.
WRITE PESTS—MINE.

FUMIGATION AND PLASTICS

News release discusses use co-ordination of such diverse chemical products as plastics and fumigants in connection with infested bagged grain, seed, packaged or boxed foodstuffs. Methyl bromide-plastic-tarpaulin method of disinfestation described.
WRITE PESTS—DOW.

RESPONSE OF RATS MAINTAINED ON DIETS FUMIGATED WITH METHYL BROMIDE

Research material reprinted from Food Research
WRITE PESTS—DOW-RESEARCH.


KILLER-DILLER
NO FUSS · NO MUSS · NO MIXING
KILLS 'EM DEADER'N A DOORNAIL
NO FUSS
NO MUSS
NO MIXING
GUARANTEE
KILLER-DILLER is laboratory compounded from poisonous chemicals for eradicating both rats and mice. If KILLER-DILLER does not satisfy, your money will be cheerfully refunded.

RAT and MOUSE POISON

Made and Guaranteed by

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(Classified)

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Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 1200 Oak St., Kansas City 6, Mo., giving box number as well.

Manager, Consultant, Salesman with thorough knowledge of general pest control (no termites) in one of the most modern offices in the middle west. Over 20,000 people a year come, 'phone, or write our office for consultation. Must have a good personality, good habits, and be able to take responsibility. The community is predominantly Protestant, therefore, a Protestant will do better. $5,000.00 per year, with unlimited future possibilities for the right man. Write full qualifications, education, experience, age. Information will be held in strictest confidence. Box 2, c/o Pests.

FUMIGATION SAFETY RULE

Bulletin discusses importance of personal inspection of entire premises immediately before releasing gas, and offers some constructive suggestions with respect thereto.

WRITE PESTS—AC 81.

STERILIZING GAS MASKS

News bulletin describes a chemical that is claimed by the manufacturer to be effective in sterilization of gas masks. Bulletin also discusses antidotes and first aid, particularly an inhalant which functions best as an antidote to HCN poisoning, and where obtainable.

WRITE PESTS—AC-73.

FUMIGATION SAFETY SUGGESTIONS

Of timely interest, in view of the at-hand fumigation season, is this bulletin which advocates as a safety measure the use of methyl orange-mercuric chloride test papers for the presence of HCN. It also discusses can openers for Zyklon Discoids, the need for adequate ventilation after fumigations, and gives a cautionary note on pilot lights in premises to be fumigated.

WRITE PESTS—AMERICAN.

TERMITE CONTROL

Folder discusses concentrates available for two distinct methods of termite control: (1) treatment of timbers in place with an oil solution, and (2) treatment of all soil around an infested building or area with either an oil or water soluble chemical. Issuing company states it specializes in all problems concerning wood-destroying organisms and also wood preservation and invites your inquiries thereto.

WRITE PESTS—WOOD.

MILITARY FUMIGATION MANUAL

This special 48-page manual has been prepared for the benefit of officers and civilians in the Armed Forces who are responsible for vermin control, and for PCOs who may contract with the Armed Forces for fumigating work. Among other subjects, the manual discusses: dosage, preparation of building for fumigation, fumigation operation, common pests, cockroach control; precautions, first aid methods, etc.

WRITE PESTS—AC.

SYNTHETIC ROACH POWDERS

Research material apropos thiocyanates in powdered form for roach control in place of pyrethrum—describes the development and properties of roach, ant and bedbug powder based on Lethane A-70.

WRITE PESTS—SYNTHETIC.

SPECIAL ROACH POWDER

Circular describes a roach powder (containing Lethane A 70) which, it is stated, is fast acting, positive in kill and will not deteriorate for at least eight weeks after application. As a result, the supplier points out, the PCO does not have to service his customers as often, thereby conserving manpower. Moreover, it is stated, the powder is non-toxic to warm-blooded animals and may, therefore, be used in dairies, packing and food handling plants, homes, etc., in fact, in all places where sodium fluoride mixtures may not be used. . . . Described also is a sodium fluoride-Pyrane formulation for the PCO who wishes to make his own roach powder.

WRITE PESTS—BOSLEY.

LETHANE A-70

Folder discusses roach, ant and bedbug powders based on this new insecticide concentrate. Described are: safety factors, cost per application, killing power, performance data, residual activity, tenacity, etc.

WRITE PESTS—A-70.

SOLVAY PRODUCTS

48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

FREE COPY MAY BE HAD BY PEST CONTROL OPERATORS.

WRITE PESTS—SOLVAY, c/o PESTS.

NEW RAT BAIT

The current difficulty of procuring rat baits because of meat rationing has been overcome by the discovery on the part of numerous PCO's of Vegex Dry Gravy, states its manufacturer.

This product with a delicious meat flavor, and high in hydrolized vegetable protein seems to be an irresistable lure for rats, according to the same source.

It has many advantages. It is instantly prepared by simply adding water and boiling up once.

The prepared bait can be handily carried in the kit, and the bait need never be touched, as bread can be dipped in the poison mixture by tongs. Keeps indefinitely and needs no refrigeration, it is stated.

Results with Vegex Dry Gravy have been so good in rodenticide work, and the Gravy is so inexpensive and easily handled that PCO's who have used it are expecting, according to the supplier, to continue even after war rationing is a thing of the past.

The Vegex Company, located at 175 Fifth Avenue, New York 10, N. Y., puts up this Dry Gravy in 5-pound packages only. One 5-pound package makes 5 gallons of finished Gravy. Prices and other pertinent data on Vegex Rat Bait may be had by writing the company.

DEODORANT

Catalog includes price data, etc., on deodorant which it is felt can neutralize and deodorize such toxic agents as Thanite, Lethane 384 Special, Velsicol, etc. Also contains data on perfume oils for sprays made with pyrethrum and kerosene.

WRITE PESTS—MAGNUS.

METHYL BROMIDE

What it is; what it does; how to use it—all these questions apropos methyl bromide are covered in an instructive and informative brochure. Described are dosage schedule for various type pests, methods of application and preliminary precautionary measures.

WRITE PESTS—Westvaco.

ALABAMA OPERATES STATE-WIDE RAT CONTROL PROGRAM TO STOP SPREAD OF TYPHUS FEVER

An article written by Dr. Andrew J. Perolio, State Director of Typhus Control of the State of Alabama which describes the State's program for stopping the spread of typhus fever.

WRITE PESTS—AC.

Hydrocyanic Acid Poisoning—Skin Absorption

Bulletin discusses some pertinent safety suggestions with respect to avoidance of hydrocyanic acid poisoning through skin absorption.

WRITE PESTS—A-C-74.

CONTINUOUS INTIMATE BLENDING

A bulletin on the intimate blending of fine chemical, food and insecticide powders has recently been issued by Sprout, Waldron & Company, Manufacturing Engineers. In addition to a description of Blending Systems designed for continuous, automatic operation, there is a page of photographs which show the difference between intimate blending and conventional mixing as revealed by typical spatula tests. Copies of this 8-page bulletin in two colors may be obtained from PESTS—SPROUT.

REMOVAL OF PHOTOGRAPHIC FILMS AND PAPERS BEFORE FUMIGATION

is the title of an interesting and informative Bulletin which discusses the effects of hydrocyanic acid vapors upon unexposed photographic film. Other subjects discussed are: "High Temperature Necessary for Winter Fumigation"; "The Rat Menace—An Opportunity to Cooperate."

WRITE PESTS—A-C-88.

INSECT COLLECTIONS

Booklet describes pocket display case which may slip easily into a coat pocket making it of value for salesmen or others who travel about. Life history collections of structural type pests are also available for the PCO.

WRITE PESTS—WARD'S.

EFFECT OF HYDROCYANIC ACID ON FOODSTUFFS

This bulletin answers some highly interesting questions as to the effect of HCN on footstuffs.

WRITE PESTS—A-C 89.

THALLIUM PRODUCTS

Circular calls attention to ant traps and jelly bait for control of ants—house or garden; mice seeds, rat paste, etc.

WRITE PESTS—NOTT.

RESPIRATOR

Bulletin discusses "Clear-Vue" model Dustfoe Respirator, which it is stated is durable, odorless, noncorrosive and a non-conductor of electricity and heat and gives a proved protection against toxic dusts.

WRITE PESTS—DUSTFOE.

HYDROCYANIC GAS MASK

Bulletin describes Hydrocyanic gas mask with all-vision facepiece.

WRITE PESTS—MINE.

NEW PERFUMING PRINCIPLE FOR INSECT SPRAY TOXIC AGENTS

Perfume Oil Fruit Berry MM&R is called the first new and different neutralizer-perfume in a decade, by Magnus, Mabee & Reynard, Inc., New York essential oil house.

Perfume Oil Fruit Berry MM&R not only neutralizes the odor of toxic agents, but imparts a truly refreshing fragrance of uncommonly light character. It has a definite fruity scent. A remarkable feature is that it has so light a fragrance, yet has the hiding power to give lasting coverage of heavy odors. This feature will be of particular interest for sprays used in food plants, bakeries, etc.

Fragrance of sprays, up to now one of the unmentionables of insect toxicants, now becomes an asset instead of a liability. Samples may be had by writing PESTS—MABEE.

ELECTRIC FANS

Bulletin discusses value of electric fans in connection with fumigation work, also some pertinent thoughts on the Schafer Prone Pressure Method of Resuscitation, etc.

WRITE PESTS—AC-69.

Advantage of low dosage fumigation at frequent intervals—warehouses and factories—is discussed in this bulletin. Inadvisability of fumigating cold houses also reviewed.

WRITE PESTS—AC-90.

ANIMAL ODORS AS REPELLENTS AND ATTRACTANTS

Incorporation of the glandular extraction of the skunk into commercial repellents to add to their potency and efficacy is discussed in an interesting article, entitled "The Odor of an Enemy, the Cat, Frightens Mice Away," by Charles V. Sparhawk. In it he also discusses the use of a small quantity of a muskrat bait in the form of a gland as a powerful attraction to any creature that feeds on meat, such as mosquitoes, flies, ticks, lice, rats and mice, etc.

WRITE PESTS—SPARHAWK.

NH DUST

Leaflet describes new organic insecticide compound which, it is stated, may be used where non-poisonous insecticides are mandatory. Effective against roaches, silverfish, ants, fleas, lice and many other common pests found in the home, industrial and food storage plants.

WRITE PESTS—POWELL.

FUMIGATION SAFETY RULES

Bulletin discusses fumigation safety rules with respect to mattresses, pillows, bedding, clothing and bedroom rugs, etc.

WRITE PESTS—AC No. 79.

STANLEY'S PATENTED PIGEON-PROOFING

Economically, Permanently, Positively and **Lawfully** from any type of structure.

Stanley's Roofing & Building Service, Inc.

523 West 184th St. New York, N. Y.

Telephone: WAdsworth 7-3300-1

WIZO

RAT GLUE BOARDS

Eliminate Use of Poison!

Require No Bait!

A practical and economical way to rid buildings of rodent pests! No hazards of poisoned bait . . . or of decomposition! Easy to prepare! Just place WIZO Rat Boards near rat hole or form a runway next to walls. Fasten boards to floor to prevent pulling away. Rodents are caught firmly the moment they step on the boards.

WIZO RAT GLUE can be obtained in quantities for preparing your own boards. Write for complete particulars.

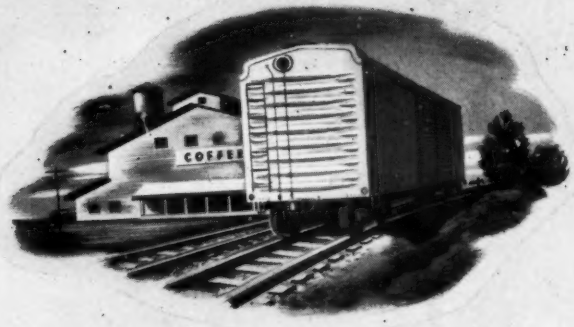
ELKAY PRODUCTS CO.

323-27 West 16th St. New York, N. Y.

Case History*

BOX CAR FUMIGATION OF COFFEE

Now Coffee Doesn't Keep Him Awake Nights



*Actual record is on file at The Dow Chemical Company

A large processor of coffee lost plenty of sleep worrying about pests which infested incoming cars of green coffee. He needed an effective fumigant that would do the job quickly to prevent piling up of demurrage charges. He couldn't find one—until a professional fumigator who knew his business suggested Dow Methyl Bromide. Results: The exit of all pests and the end of fumigation worries. Here's how the job was done:

Control Measures: Car carefully sealed with tape.

Dosage and Exposure Period: Between 10 and 12 pounds of Methyl Bromide per car since temperatures averaged only 60° F. during 18-hour exposure period.

Method of Application: Jiffy applicator with Saran tube released the gas from outside.

Aeration Period: 45 minutes.

Results: Thorough examination revealed no insect life. Because of speedy fumigation and aeration, cars could be unloaded without costly delay.

This case history is a typical example of the way Dow Methyl Bromide tackles tough fumigation jobs. Write for further information on how it can help you increase profits.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis
Houston • San Francisco • Los Angeles • Seattle

The penetrating fumigant

Methyl Bromide

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

PLAN TO REPEL THAT SPRING INVASION NOW!

An invading army is converging on all objectives. The attack may be expected at any moment. All resources for defense must be massed against the enemy. Plans must be made AT ONCE to repel this certain invasion.

Check your stocks of HI-TOX, MORTICIDE, SUPER-MORTICIDE, MORTOLIN, ASSCO ROACH POWDER and POWDERED FORTIFIED RED SQUILLS. You will avoid disappointment and consequent operational loss by ordering your SPRING requirements NOW!—You should have at least a sixty day supply of all our products on hand at all times to protect yourself against transportation delays.

If you are still unacquainted with our products, write our office nearest you for samples and data.

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